
CORSIKA 8 Documentation

Release prototype-0.1.0

CORSIKA 8 Collaboration

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Welcome to the CORSIKA 8 air shower simulation framework.

CORSIKA 8 FRAMEWORK FOR PARTICLE CASCADES IN ASTROPARTICLE PHYSICS

The purpose of CORSIKA is to simulate any particle cascades in astroparticle physics or astrophysical context. A lot of emphasis is put on modularity, flexibility, completeness, validation and correctness. To boost computational efficiency different techniques are provided, like thinning or cascade equations. The aim is that CORSIKA remains the most comprehensive framework for simulating particle cascades with stochastic and continuous processes.

The software makes extensive use of static design patterns and compiler optimization. Thus, the most fundamental configuration decision of the user must be performed at compile time. At run time model parameters can still be changed.

CORSIKA 8 is by default released under the GPLv3 license. See [license file](#) which is part of every release and the source code.

If you use, or want to refer to, CORSIKA 8 please cite “Towards a Next Generation of CORSIKA: A Framework for the Simulation of Particle Cascades in Astroparticle Physics”, *Comput.Softw.Big Sci.* 3 (2019) 2. We kindly ask (and require) any relevant improvement or addition to be offered or contributed to the main CORSIKA 8 repository for the benefit of the whole community.

When you plan to contribute to CORSIKA 8 check the guidelines outlined here: [coding guidelines](#). Code that fails the review by the CORSIKA author group must be improved before it can be merged in the official code base. After your code has been accepted and merged, you become a contributor of the CORSIKA 8 project (code author).

IMPORTANT: Before you contribute, you need to read and agree to the [collaboration agreement](#). The agreement can be discussed, and eventually improved.

We also want to point you to the [MCnet guidelines](#), which are very useful also for us.

1.1 Get in contact

- Connect to <https://gitlab.ikp.kit.edu> register yourself and join the “Air Shower Physics” group. Write to me (ralf.ulrich@kit.edu) only in case there are problems with that.
- Connect to corsika-devel@lists.kit.edu (self-register at <https://www.lists.kit.edu/sympa/subscribe/corsika-devel>) to get in touch with the project.
- Register on the corsika slack channel.

1.2 Installation

CORSIKA 8 is tested regularly at least on gcc7.3.0 and clang-8.0.0.

1.2.1 Prerequisites

You will also need:

- Python 3 (supported versions are Python ≥ 3.6), with pip
- conan (via pip)
- cmake
- git
- g++, gfortran, binutils, make

On a bare Ubuntu 20.04, just add:

```
sudo apt-get install python3 python3-pip cmake g++ gfortran git doxygen graphviz
```

On a bare CentOS 7 install python3, pip3 (pip from python3) and cmake3. Any of the devtools 7, 8, 9 should work (at least). Also initialize devtools, before building CORSIKA 8:

```
source /opt/rh/devtoolset-9/enable
```

CORSIKA 8 uses the [conan](#) package manager to manage our dependencies. If you do not have Conan installed, it can be installed with:

```
pip install --user conan
```

1.2.2 Compiling

Once Conan is installed, follow these steps to download and install CORSIKA 8:

```
git clone --recursive git@gitlab.ikp.kit.edu:AirShowerPhysics/corsika.git
mkdir corsika-build
cd corsika-build
cmake ../corsika -DCMAKE_INSTALL_PREFIX=../corsika-install
make -j8
make install
```

1.3 Installation (using docker containers)

There are docker containers prepared that bring all the environment and packages you need to run CORSIKA. See [docker hub](#) for a complete overview.

1.3.1 Prerequisites

You only need docker, e.g. on Ubuntu: `sudo apt-get install docker` and of course root access.

1.4 Compiling

Follow these steps to download and install CORSIKA 8, master development version

```
git clone --recursive https://gitlab.ikp.kit.edu/AirShowerPhysics/corsika.git
sudo docker run -v $PWD:/corsika -it corsika/devel:clang-8 /bin/bash
mkdir build
cd build
cmake ../corsika -DCMAKE_INSTALL_PREFIX=../corsika-install
make -j8
make install
```

1.5 Runing Unit Tests

Note, before you run *any* executbale you must also define the `CORSIKA_DATA` environment variable to point to the location where you cloned corsika modules/data, thus typically

```
export CORSIKA_DATA=$PWD/../../corsika/modules/data
```

To run the Unit Tests, just type `ctest` in your build area.

1.6 Running examples

To see how a relatively simple hadron cascade develops, see `examples/cascade_example.cpp` for a starting point.

To run the `cascade_example`, or any other CORSIKA 8 application, you must first compile it wrt. to the CORSIKA 8 header-only framework. This can be done best by copying e.g. `corsika-install/share/corsika/examples/` to your working place (e.g. `corsika-work`).

Next, you need to define the environment variable `corsika_DIR` to point to, either, your build, or your install area. Thus, e.g.

```
export corsika_DIR=<dir where you installed CORSIKA 8 to, or where you buld it">
```

Then compile your example/application with

```
cd corsika-work
cmake .
make
bin/cascade_example
```

Visualize output (needs gnuplot installed):

```
bash $corsika_DIR/share/corsika/tools/plot_tracks.sh tracks.dat
firefox tracks.dat.gif
```

(note, if you use the `corsika_DIR` to point to the build area: the script `plot_tracks.sh` is not copied to the build area, it is only part of the source tree at `tools/plot_tracks.sh`)

Or also consider the `vertical_EAS` example in the same directory, which can be configured with command line options. Run `bin/vertical_EAS` to get basic help.

1.6.1 Generating doxygen documentation

To generate the documentation, you need doxygen and graphviz. If you work with the docker `corsika/devel` containers this is already included. Otherwise, e.g. on Ubuntu 18.04, do:

```
sudo apt-get install doxygen graphviz
```

Switch to the `corsika` build directory and do

```
make doxygen
make install
```

open with firefox:

```
firefox ../corsika-install/share/corsika/doc/html/index.html
```

PHYSICS MODULES AND PROCESSES

group **Processes**

Physics processes in CORSIKA 8 are clustered in *ProcessSequence* and *SwitchProcessSequence* containers.

The former is a mere (ordered) collection, while the latter has the option to switch between two alternative *ProcessSequences*.

Depending on the type of data to act on and on the allowed actions of processes there are several interface options:

- *InteractionProcess*
- *DecayProcess*
- *ContinuousProcess*
- *StackProcess*
- *SecondariesProcess*
- *BoundaryCrossingProcess*

And all processes (including *ProcessSequence* and *SwitchProcessSequence*) are derived from *BaseProcess*.

Processes of any type (e.g. p1, p2, p3,...) can be assembled into a *ProcessSequence* using the `make_sequence` factory function.

```
auto sequence1 = make_sequence(p1, p2, p3);  
auto sequence2 = make_sequence(p4, p5, p6, p7);  
auto sequence3 = make_sequence(sequence1, sequence2, p8, p9);
```

Note, if the order of processes matters, the order of occurrence in the *ProcessSequence* determines the execution order.

SecondariesProcess always act on new secondaries produced (i.e. in *InteractionProcess* and *DecayProcess*) in the scope of their *ProcessSequence*. For example if i1 and i2 are *InteractionProcesses* and s1 is a *SecondariesProcess*, then

```
auto sequence = make_sequence(i1, make_sequence(i2, s1))
```

will result in s1 acting only on the particles produced by i2 and not by i1. This can be very useful, e.g. to fine tune thinning.

A special type of *ProcessSequence* is *SwitchProcessSequence*, which has two branches and a functor that can select between these two branches.

```
auto sequence = make_switch(sequence1, sequence2, selector);
```

where the only requirement to `selector` is that it provides a `SwitchResult operator() (Particle const& particle) const` method. Thus, based on the dynamic properties of `particle` the functor can make its decision. This is clearly important for switching between low-energy and high-energy models, but not limited to this. The selection can even be done with a lambda function.

```
template<typename TDerived>
```

```
struct corsika::BaseProcess : public corsika::_BaseProcess
```

```
#include <BaseProcess.hpp> Each process in C8 must derive from BaseProcess.
```

The structural base type of a process object in a *ProcessSequence*. Both, the *ProcessSequence* and all its elements are of type *BaseProcess*

Todo:

rename *BaseProcess* into just *Process*

rename `_BaseProcess`, or find better alternative in `FIXME ./Processes/AnalyticProcessors/ExecTime.h`, see e.g. how this is done in `ProcessSequence.hpp/make_sequence`

Subclassed by *corsika::BoundaryCrossingProcess*< *TDerived* >, *corsika::ContinuousProcess*< *TDerived* >, *corsika::DecayProcess*< *TDerived* >, *corsika::InteractionProcess*< *TDerived* >, *corsika::SecondariesProcess*< *TDerived* >, *corsika::StackProcess*< *TDerived* >

Public Types

```
using process_type = TDerived
```

Base processor type for use in other template classes.

Public Static Functions

```
static inline unsigned int constexpr getNumberOfProcesses ()
```

Default number of processes is just one, obviously.

```
template<typename TDerived>
```

```
class BoundaryCrossingProcess : public corsika::BaseProcess<TDerived>
```

```
#include <BoundaryCrossingProcess.hpp> Processes acting on the particles traversal from one volume into another volume.
```

Create a new *BoundaryCrossingProcess*, e.g. for *XYModel*, via

```
class XYModel : public BoundaryCrossingProcess<XYModel> {};
```

and provide the necessary interface method:

```
template <typename TParticle>
ProcessReturn XYModel::doBoundaryCrossing(TParticle& Particle,
                                           typename TParticle::node_type const& from,
                                           typename TParticle::node_type const& to);
```

where `Particle` is the object to read particle data from a *Stack*. The volume the particle is originating from is `from`, the volume where it goes to is `to`.

```
template<typename TDerived>
```

```
class ContinuousProcess : public corsika::BaseProcess<TDerived>
```

```
#include <ContinuousProcess.hpp> Processes with continuous effects along a particle Trajectory.
```

Create a new *ContinuousProcess*, e.g. for XYModel, via

```
class XYModel : public ContinuousProcess<XYModel> {};
```

and provide two necessary interface methods:

```
template <typename TParticle, typename TTrack>
LengthType getMaxStepLength(TParticle const& p, TTrack const& track) const;
```

which allows any *ContinuousProcess* to tell to CORSIKA a maximum allowed step length. Such step-length limitation, if it turns out to be smaller/sooner than any other limit (decay length, interaction length, other continuous processes, geometry, etc.) will lead to a limited step length.

```
template <typename TParticle, typename TTrack>
ProcessReturn doContinuous(TParticle& p, TTrack const& t, bool const_
↳stepLimit)
const;
```

which applied any continuous effects on Particle p along Trajectory t. The particle in all typical scenarios will be altered by a doContinuous. The flag stepLimit will be true if the previous evaluation of getMaxStepLength resulted in this particular *ContinuousProcess* to be responsible for the step length limit on the current track t. This information can be exploited and avoid e.g. any unnecessary calculations.

Particle and Track are the valid classes to access particles and track (Trajectory) data on the Stack. Those two methods do not need to be templated, they could use the types e.g. corsika::setup::Stack::particle_type but by the cost of losing all flexibility otherwise provided.

```
class ContinuousProcessIndex
```

```
#include <ContinuousProcessIndex.hpp> To index individual processes (continuous processes) inside a
ProcessSequence.
```

```
class ContinuousProcessStepLength
```

```
#include <ContinuousProcessStepLength.hpp> To store step length in LengthType and unique index in
ProcessSequence of shortest step ContinuousProcess.
```

```
template<typename TDerived>
```

```
struct DecayProcess : public corsika::BaseProcess<TDerived>
```

```
#include <DecayProcess.hpp> Process describing the decay of particles.
```

Create a new *DecayProcess*, e.g. for XYModel, via

```
class XYModel : public DecayProcess<XYModel> {};
```

and provide the two necessary interface methods

```
template <typename TSecondaryView>
void XYModel::doDecay(TSecondaryView&);

template <typename TParticle>
TimeType getLifetime(TParticle const&)
```

Where, of course, SecondaryView and Particle are the valid classes to access particles on the Stack. Those two methods do not need to be templated, they could use the types e.g. corsika::setup::Stack::particle_type but by the cost of losing all flexibility otherwise provided.

SecondaryView allows to retrieve the properties of the projectile particles, AND to store new particles (secondaries) which then subsequently can be processes by *SecondariesProcess*. This is how the output of decays can be studied right away.

```
template<class TCountedProcess>
class corsika::InteractionCounter : public corsika::InteractionProcess<InteractionCounter<TCountedProcess>
    #include <InteractionCounter.hpp> Wrapper around an InteractionProcess that fills histograms of the
    number of calls to doInteraction() binned in projectile energy (both in lab and center-of-mass
    frame) and species

    Use by wrapping a normal InteractionProcess
```

```
InteractionProcess collision1;
InteractionCounter<collision1> counted_collision1;
```

Public Functions

```
template<typename TSecondaryView>
void doInteraction (TSecondaryView &view)
    wrapper around internal process doInteraction

template<typename TParticle>
GrammageType getInteractionLength (TParticle const &particle) const
    ! returns internal process getInteractionLength

InteractionHistogram const &getHistogram () const
    returns the filled histograms
```

Return *InteractionHistogram*, which contains the histogram data

```
class corsika::InteractionHistogram
    #include <InteractionHistogram.hpp> Class that creates and stores histograms of collisions  $dN/dE_{lab}$ ,
     $dN/d\sqrt{s}$  which is used by class InteractionCounter.

    Histograms are of type boost::histogram
```

Public Functions

```
void fill (Code projectile_id, HEPEnergyType lab_energy, HEPEnergyType mass_target, int A =
    0, int Z = 0)
    fill both CMS and lab histograms at the same time
```

Parameters

- projectile_id: corsika::Code of particle
- lab_energy: Energy in lab. frame
- mass_target: Mass of target particle
- A: if projectile_id is corsika::Nucleus : Mass of nucleus
- Z: if projectile_id is corsika::Nucleus : Charge of nucleus

```
inline hist_type const &CMSHist () const
    return histogram in c.m.s. frame
```

```
inline hist_type const &labHist () const
    return histogram in laboratory frame
```

```
template<typename TDerived>
```

class InteractionProcess : public corsika::BaseProcess<TDerived>
#include <InteractionProcess.hpp> Process describing the interaction of particles.

Create a new *InteractionProcess*, e.g. for XYModel, via

```
class XYModel : public InteractionProcess<XYModel> {};
```

and provide the two necessary interface methods

```
template <typename TSecondaryView>
void XYModel::doInteraction(TSecondaryView&);

template <typename TParticle>
GrammarType XYModel::getInteractionLength(TParticle const&)
```

Where, of course, SecondaryView and Particle are the valid classes to access particles on the Stack. Those two methods do not need to be templated, they could use the types e.g. corsika::setup::Stack::particle_type but by the cost of loosing all flexibility otherwise provided.

SecondaryView allows to retrieve the properties of the projectile particles, AND to store new particles (secondaries) which then subsequently can be processes by *SecondariesProcess*. This is how the output of interactions can be studied right away.

class corsika::NullModel
#include <NullModel.hpp> Process that does nothing.

It is not even derived from *BaseProcess*

Public Static Functions

static inline unsigned int constexpr getNumberOfProcesses ()
Default number of processes is just one, obviously.

template<typename TDerived>
class SecondariesProcess : public corsika::BaseProcess<TDerived>
#include <SecondariesProcess.hpp> Processes acting on the secondaries produced by other processes.

Create a new *SecondariesProcess*, e.g. for XYModel, via

```
class XYModel : public SecondariesProcess<XYModel> {};
```

and provide the necessary interface method:

```
template <typename TStackView>
void doSecondaries(TStackView& StackView);
```

where StackView is an object that can store secondaries on a stack and also iterate over these secondaries.

template<typename TDerived>
class corsika::StackProcess : public corsika::BaseProcess<TDerived>
#include <StackProcess.hpp> Process to act on the entire particle stack.

Create a new *StackProcess*, e.g. for XYModel, via

```
class XYModel : public StackProcess<XYModel> {};
```

and provide the necessary interface method

```
template <typename TStack>
void XYModel::doStack(TStack&);
```

Where, of course, *Stack* is the valid class to access particles on the Stack. This methods does not need to be templated, they could use the types e.g. `corsika::setup::Stack` directly but by the cost of loosing all flexibility otherwise provided.

A *StackProcess* has only one constructor `StackProcess::StackProcess(unsigned int const nStep)` where `nStep` is the number of steps of the cascade stepping after which the stack process should be run. Good values are on the order of 1000, which will not compromise run time in the end, but provide all the benefits of the *StackProcess*.

The number of “steps” during the cascade processing after

which this *StackProcess* is going to be executed.

The logic is “`iStep_ modulo nStep_`”

Public Functions

inline int getStep() const
return the current Cascade step counter

inline bool checkStep()
check if current step is where *StackProcess* should be executed, this also increases the internal step counter implicitly

```
template<typename TProcess1, typename TProcess2, typename TSelect, int IndexFirstProcess = 0, int IndexOfProcess1 = 0, int IndexOfProcess2 = 0>
class corsika::SwitchProcessSequence : public corsika::BaseProcess<SwitchProcessSequence<TProcess1, TProcess2, TSelect, IndexFirstProcess, IndexOfProcess1, IndexOfProcess2>>
#include <SwitchProcessSequence.hpp> Class to switch between two process branches.
```

A compile-time static list of processes that uses an internal *TSelect* class to switch between different versions of processes (or process sequence).

TProcess1 and *TProcess2* must be derived from *BaseProcess* and are both references if possible (lvalue), otherwise (rvalue) they are just classes. This allows us to handle both, rvalue as well as lvalue Processes in the *SwitchProcessSequence*.

TSelect has to implement a `operator() (const Particle&)` and has to return either `SwitchResult::First` or `SwitchResult::Second`. Note: *TSelect* may absolutely also use random numbers to sample between its results. This can be used to achieve arbitrarily smooth transition or mixtures of processes.

Warning: do not put *StackProcess* into a *SwitchProcessSequence* since this makes no sense. The *StackProcess* acts on an entire particle stack and not on individual particles.

Template parameters: See also class *ProcessSequence*.

Template Parameters

- *TProcess1*: is of type *BaseProcess*, either a dedicated process, or a *ProcessSequence*
- *TProcess2*: is of type *BaseProcess*, either a dedicated process, or a *ProcessSequence*
- *TSelect*: selector functor/function
- *IndexFirstProcess*: to count and index each Process in the entire process-chain
- *IndexOfProcess1*: index of *TProcess1* (counting of Process)
- *IndexOfProcess2*: index of *TProcess2* (counting of Process)

Public Functions

inline SwitchProcessSequence (*TProcess1 in_A, TProcess2 in_B, TSelect sel*)

Only valid user constructor will create fully initialized object.

SwitchProcessSequence supports and encourages move semantics. You can use object, l-value references or r-value references to construct sequences.

Parameters

- *in_A*: process branch A
- *in_B*: process branch B
- *sel*: functor to switch between branch A and B

Public Static Functions

static inline unsigned int constexpr getNumberOfProcesses ()

static counter to uniquely index (count) all *ContinuousProcess* in switch sequence.

```
template<typename TProcess1, typename TProcess2 = NullModel, int ProcessIndexOffset = 0, int IndexOfProcess1 = 0>
class corsika::ProcessSequence : public corsika::BaseProcess<ProcessSequence<TProcess1, TProcess2>>
#include <ProcessSequence.hpp>
```

Definition of a static process list/sequence

A compile time static list of processes. The compiler will generate a new type based on template logic containing all the elements provided by the user.

TProcess1 and TProcess2 must both be derived from *BaseProcess*, and are both references if possible (lvalue), otherwise (rvalue) they are just classes. This allows us to handle both, rvalue as well as lvalue Processes in the *ProcessSequence*.

(For your potential interest, the static version of the *ProcessSequence* and all Process types are based on the CRTP C++ design pattern)

Template parameters:

Template Parameters

- TProcess1: is of type *BaseProcess*, either a dedicated process, or a *ProcessSequence*
- TProcess2: is of type *BaseProcess*, either a dedicated process, or a *ProcessSequence*
- IndexFirstProcess: to count and index each Process in the entire process-chain. The offset is the starting value for this *ProcessSequence*
- IndexOfProcess1: index of TProcess1 (counting of Process)
- IndexOfProcess2: index of TProcess2 (counting of Process)

Public Functions

inline ProcessSequence (*TProcess1 in_A, TProcess2 in_B*)

Only valid user constructor will create fully initialized object.

ProcessSequence supports and encourages move semantics. You can use object, l-value references or r-value references to construct sequences.

Parameters

- *in_A*: process/list A
- *in_A*: process/list B

bool **checkStep** ()

The processes of type *StackProcess* do have an internal counter, so they can be executed only each N steps.

Often these are “maintenance processes” that do not need to run after each single step of the simulations. In the CheckStep function it is tested if either *A_* or *B_* are *StackProcess* and if they are due for execution.

template<typename **TStack**>

void **doStack** (*TStack &stack*)

Execute the StackProcess-es in the *ProcessSequence*.

template<typename **TParticle**, typename **TTrack**>

ContinuousProcessStepLength **getMaxStepLength** (*TParticle &particle, TTrack &vTrack*)

Calculate the maximum allowed length of the next tracking step, based on all ContinuousProcess-es.

The maximum allowed step length is the minimum of the allowed track length over all ContinuousProcess-es in the *ProcessSequence*.

Return *ContinuousProcessStepLength* which contains the step length itself in LengthType, and a unique identifier of the related *ContinuousProcess*.

Public Static Functions

static inline unsigned int constexpr getNumberOfProcesses ()

static counter to uniquely index (count) all *ContinuousProcess* in switch sequence.

PARTICLE PROPERTIES

3.1 Particle Classes

group **ParticleClasses**

class Unknown

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=0`
- `mass=0.0 GeV`
- `charge= 0`
- `name=Unknown`
- `anti=Unknown`

class Electron

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=11`
- `mass=0.000511 GeV`
- `charge= -1`
- `name=Electron`
- `anti=Positron`

class Positron

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=-11`
- `mass=0.000511 GeV`
- `charge= 1`
- `name=Positron`
- `anti=Electron`

class NuE

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=12
- mass=0.0 GeV
- charge= 0
- name=*NuE*
- anti=*NuEBar*

class NuEBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-12
- mass=0.0 GeV
- charge= 0
- name=*NuEBar*
- anti=*NuE*

class MuMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=13
- mass=0.10566 GeV
- charge= -1
- name=*MuMinus*
- anti=*MuPlus*

class MuPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-13
- mass=0.10566 GeV
- charge= 1
- name=*MuPlus*
- anti=*MuMinus*

class NuMu

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=14
- mass=0.0 GeV
- charge= 0

- name=*NuMu*
- anti=*NuMuBar*

class NuMuBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-14
- mass=0.0 GeV
- charge= 0
- name=*NuMuBar*
- anti=*NuMu*

class TauMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=15
- mass=1.77682 GeV
- charge= -1
- name=*TauMinus*
- anti=*TauPlus*

class TauPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-15
- mass=1.77682 GeV
- charge= 1
- name=*TauPlus*
- anti=*TauMinus*

class NuTau

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=16
- mass=0.0 GeV
- charge= 0
- name=*NuTau*
- anti=*NuTauBar*

class NuTauBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-16

- mass=0.0 GeV
- charge= 0
- name=*NuTauBar*
- anti=*NuTau*

class Gamma

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=22
- mass=0.0 GeV
- charge= 0
- name=*Gamma*
- anti=*Unknown*

class H0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=25
- mass=125.0 GeV
- charge= 0
- name=*H0*
- anti=*Unknown*

class Pi0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=111
- mass=0.13498 GeV
- charge= 0
- name=*Pi0*
- anti=*Unknown*

class Rho0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=113
- mass=0.77549 GeV
- charge= 0
- name=*Rho0*
- anti=*Unknown*

class K0Long

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=130`
- `mass=0.49761 GeV`
- `charge= 0`
- `name=K0Long`
- `anti=Unknown`

class PiPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=211`
- `mass=0.13957 GeV`
- `charge= 1`
- `name=PiPlus`
- `anti=PiMinus`

class PiMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=-211`
- `mass=0.13957 GeV`
- `charge= -1`
- `name=PiMinus`
- `anti=PiPlus`

class RhoPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=213`
- `mass=0.77549 GeV`
- `charge= 1`
- `name=RhoPlus`
- `anti=RhoMinus`

class RhoMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=-213`
- `mass=0.77549 GeV`
- `charge= -1`

- name=*RhoMinus*
- anti=*RhoPlus*

class Pi1300Plus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=100211
- mass=1.3 GeV
- charge= 1
- name=*Pi1300Plus*
- anti=*Pi1300Minus*

class Pi1300Minus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-100211
- mass=1.3 GeV
- charge= -1
- name=*Pi1300Minus*
- anti=*Pi1300Plus*

class Pi1300_0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=100111
- mass=1.3 GeV
- charge= 1
- name=*Pi1300_0*
- anti=*Unknown*

class Eta

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=221
- mass=0.54785 GeV
- charge= 0
- name=*Eta*
- anti=*Unknown*

class Omega

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=223

- mass=0.78265 GeV
- charge= 0
- name=*Omega*
- anti=*Unknown*

class K0Short

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=310
- mass=0.49761 GeV
- charge= 0
- name=*K0Short*
- anti=*Unknown*

class K0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=311
- mass=0.49761 GeV
- charge= 0
- name=*K0*
- anti=*K0Bar*

class K0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-311
- mass=0.49761 GeV
- charge= 0
- name=*K0Bar*
- anti=*K0*

class KStar0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=313
- mass=0.89594 GeV
- charge= 0
- name=*KStar0*
- anti=*KStar0Bar*

class KStar0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=-313`
- `mass=0.89594 GeV`
- `charge= 0`
- `name=KStar0Bar`
- `anti=KStar0`

class KStar0_1430_0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=10311`
- `mass=1.425 GeV`
- `charge= 0`
- `name=KStar0_1430_0`
- `anti=KStar0_1430_0Bar`

class KStar0_1430_0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=-10311`
- `mass=1.425 GeV`
- `charge= 0`
- `name=KStar0_1430_0Bar`
- `anti=KStar0_1430_0`

class KStar0_1430_Plus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=10321`
- `mass=1.425 GeV`
- `charge= 0`
- `name=KStar0_1430_Plus`
- `anti=KStar0_1430_MinusBar`

class KStar0_1430_MinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=-10321`
- `mass=1.425 GeV`
- `charge= 0`

- name=*KStar0_1430_MinusBar*
- anti=*KStar0_1430_Plus*

class KPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=321
- mass=0.49368 GeV
- charge= 1
- name=*KPlus*
- anti=*KMinus*

class KMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-321
- mass=0.49368 GeV
- charge= -1
- name=*KMinus*
- anti=*KPlus*

class KStarPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=323
- mass=0.89166 GeV
- charge= 1
- name=*KStarPlus*
- anti=*KStarMinus*

class KStarMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-323
- mass=0.89166 GeV
- charge= -1
- name=*KStarMinus*
- anti=*KStarPlus*

class EtaPrime

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=331

- mass=0.95778 GeV
- charge= 0
- name=*EtaPrime*
- anti=*Unknown*

class Phi

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=333
- mass=1.01946 GeV
- charge= 0
- name=*Phi*
- anti=*Unknown*

class DPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=411
- mass=1.86962 GeV
- charge= 1
- name=*DPlus*
- anti=*DMinus*

class DMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-411
- mass=1.86962 GeV
- charge= -1
- name=*DMinus*
- anti=*DPlus*

class DStarPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=413
- mass=2.01028 GeV
- charge= 1
- name=*DStarPlus*
- anti=*DStarMinus*

class DStarMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-413
- mass=2.01028 GeV
- charge= -1
- name=*DStarMinus*
- anti=*DStarPlus*

class D0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=421
- mass=1.86486 GeV
- charge= 0
- name=*D0*
- anti=*D0Bar*

class D0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-421
- mass=1.86486 GeV
- charge= 0
- name=*D0Bar*
- anti=*D0*

class DStar0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=423
- mass=2.00698 GeV
- charge= 0
- name=*DStar0*
- anti=*DStar0Bar*

class DStar0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-423
- mass=2.00698 GeV
- charge= 0

- name=*DStar0Bar*
- anti=*DStar0*

class DsPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=431
- mass=1.96849 GeV
- charge= 1
- name=*DsPlus*
- anti=*DsMinus*

class DsMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-431
- mass=1.96849 GeV
- charge= -1
- name=*DsMinus*
- anti=*DsPlus*

class DStarSPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=433
- mass=2.1123 GeV
- charge= 1
- name=*DStarSPlus*
- anti=*DStarSMinus*

class DStarSMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-433
- mass=2.1123 GeV
- charge= -1
- name=*DStarSMinus*
- anti=*DStarSPlus*

class EtaC

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=441

- mass=2.981 GeV
- charge= 0
- name=*EtaC*
- anti=*Unknown*

class Jpsi

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=443
- mass=3.09692 GeV
- charge= 0
- name=*Jpsi*
- anti=*Unknown*

class B0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=511
- mass=5.27958 GeV
- charge= 0
- name=*B0*
- anti=*B0Bar*

class B0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-511
- mass=5.27958 GeV
- charge= 0
- name=*B0Bar*
- anti=*B0*

class BPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=521
- mass=5.27925 GeV
- charge= 1
- name=*BPlus*
- anti=*BMinus*

class BMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-521
- mass=5.27925 GeV
- charge= -1
- name=*BMinus*
- anti=*BPlus*

class Bs0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=531
- mass=5.36677 GeV
- charge= 0
- name=*Bs0*
- anti=*Bs0Bar*

class Bs0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-531
- mass=5.36677 GeV
- charge= 0
- name=*Bs0Bar*
- anti=*Bs0*

class BcPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=541
- mass=6.277 GeV
- charge= 1
- name=*BcPlus*
- anti=*BcMinus*

class BcMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-541
- mass=6.277 GeV
- charge= -1

- name=*BcMinus*
- anti=*BcPlus*

class DeltaMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1114
- mass=1.232 GeV
- charge= -1
- name=*DeltaMinus*
- anti=*DeltaPlusBar*

class DeltaPlusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-1114
- mass=1.232 GeV
- charge= 1
- name=*DeltaPlusBar*
- anti=*DeltaMinus*

class Neutron

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=2112
- mass=0.93957 GeV
- charge= 0
- name=*Neutron*
- anti=*AntiNeutron*

class AntiNeutron

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-2112
- mass=0.93957 GeV
- charge= 0
- name=*AntiNeutron*
- anti=*Neutron*

class Delta0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=2114

- mass=1.232 GeV
- charge= 0
- name=*Delta0*
- anti=*Delta0Bar*

class Delta0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-2114
- mass=1.232 GeV
- charge= 0
- name=*Delta0Bar*
- anti=*Delta0*

class Proton

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=2212
- mass=0.93827 GeV
- charge= 1
- name=*Proton*
- anti=*AntiProton*

class AntiProton

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-2212
- mass=0.93827 GeV
- charge= -1
- name=*AntiProton*
- anti=*Proton*

class N1440Plus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=202212
- mass=1.44 GeV
- charge= 1
- name=*N1440Plus*
- anti=*N1440MinusBar*

class N1440MinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-202212
- mass=1.44 GeV
- charge= -1
- name=*N1440MinusBar*
- anti=*N1440Plus*

class N1440_0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=202112
- mass=1.44 GeV
- charge= 1
- name=*N1440_0*
- anti=*N1440_0Bar*

class N1440_0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-202112
- mass=1.44 GeV
- charge= -1
- name=*N1440_0Bar*
- anti=*N1440_0*

class N1710Plus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=212212
- mass=1.71 GeV
- charge= 1
- name=*N1710Plus*
- anti=*N1710MinusBar*

class N1710MinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-212212
- mass=1.71 GeV
- charge= -1

- name=*N1710MinusBar*
- anti=*N1710Plus*

class N1710_0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=212112
- mass=1.71 GeV
- charge= 1
- name=*N1710_0*
- anti=*N1710_0Bar*

class N1710_0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-212112
- mass=1.71 GeV
- charge= -1
- name=*N1710_0Bar*
- anti=*N1710_0*

class DeltaPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=2214
- mass=1.232 GeV
- charge= 1
- name=*DeltaPlus*
- anti=*DeltaMinusBar*

class DeltaMinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-2214
- mass=1.232 GeV
- charge= -1
- name=*DeltaMinusBar*
- anti=*DeltaPlus*

class DeltaPlusPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=2224

- mass=1.232 GeV
- charge= 2
- name=*DeltaPlusPlus*
- anti=*DeltaMinusMinusBar*

class DeltaMinusMinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-2224
- mass=1.232 GeV
- charge= -2
- name=*DeltaMinusMinusBar*
- anti=*DeltaPlusPlus*

class SigmaMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=3112
- mass=1.19745 GeV
- charge= -1
- name=*SigmaMinus*
- anti=*SigmaPlusBar*

class SigmaPlusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-3112
- mass=1.19745 GeV
- charge= 1
- name=*SigmaPlusBar*
- anti=*SigmaMinus*

class SigmaStarMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=3114
- mass=1.3872 GeV
- charge= -1
- name=*SigmaStarMinus*
- anti=*SigmaStarPlusBar*

class SigmaStarPlusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-3114
- mass=1.3872 GeV
- charge= 1
- name=*SigmaStarPlusBar*
- anti=*SigmaStarMinus*

class Lambda0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=3122
- mass=1.11568 GeV
- charge= 0
- name=*Lambda0*
- anti=*Lambda0Bar*

class Lambda0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-3122
- mass=1.11568 GeV
- charge= 0
- name=*Lambda0Bar*
- anti=*Lambda0*

class Sigma0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=3212
- mass=1.19264 GeV
- charge= 0
- name=*Sigma0*
- anti=*Sigma0Bar*

class Sigma0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-3212
- mass=1.19264 GeV
- charge= 0

- name=*Sigma0Bar*
- anti=*Sigma0*

class SigmaStar0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=3214
- mass=1.3837 GeV
- charge= 0
- name=*SigmaStar0*
- anti=*SigmaStar0Bar*

class SigmaStar0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-3214
- mass=1.3837 GeV
- charge= 0
- name=*SigmaStar0Bar*
- anti=*SigmaStar0*

class SigmaPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=3222
- mass=1.18937 GeV
- charge= 1
- name=*SigmaPlus*
- anti=*SigmaMinusBar*

class SigmaMinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-3222
- mass=1.18937 GeV
- charge= -1
- name=*SigmaMinusBar*
- anti=*SigmaPlus*

class SigmaStarPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=3224

- mass=1.3828 GeV
- charge= 1
- name=*SigmaStarPlus*
- anti=*SigmaStarMinusBar*

class SigmaStarMinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-3224
- mass=1.3828 GeV
- charge= -1
- name=*SigmaStarMinusBar*
- anti=*SigmaStarPlus*

class XiMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=3312
- mass=1.32171 GeV
- charge= -1
- name=*XiMinus*
- anti=*XiPlusBar*

class XiPlusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-3312
- mass=1.32171 GeV
- charge= 1
- name=*XiPlusBar*
- anti=*XiMinus*

class XiStarMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=3314
- mass=1.535 GeV
- charge= -1
- name=*XiStarMinus*
- anti=*XiStarPlusBar*

class XiStarPlusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-3314
- mass=1.535 GeV
- charge= 1
- name=*XiStarPlusBar*
- anti=*XiStarMinus*

class Xi0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=3322
- mass=1.31486 GeV
- charge= 0
- name=*Xi0*
- anti=*Xi0Bar*

class Xi0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-3322
- mass=1.31486 GeV
- charge= 0
- name=*Xi0Bar*
- anti=*Xi0*

class XiStar0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=3324
- mass=1.5318 GeV
- charge= 0
- name=*XiStar0*
- anti=*XiStar0Bar*

class XiStar0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-3324
- mass=1.5318 GeV
- charge= 0

- name=*XiStar0Bar*
- anti=*XiStar0*

class OmegaMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=3334
- mass=1.67245 GeV
- charge= -1
- name=*OmegaMinus*
- anti=*OmegaPlusBar*

class OmegaPlusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-3334
- mass=1.67245 GeV
- charge= 1
- name=*OmegaPlusBar*
- anti=*OmegaMinus*

class SigmaC0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=4112
- mass=2.45374 GeV
- charge= 0
- name=*SigmaC0*
- anti=*SigmaC0Bar*

class SigmaC0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-4112
- mass=2.45374 GeV
- charge= 0
- name=*SigmaC0Bar*
- anti=*SigmaC0*

class SigmaStarC0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=4114

- mass=2.5188 GeV
- charge= 0
- name=*SigmaStarC0*
- anti=*SigmaStarC0Bar*

class SigmaStarC0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-4114
- mass=2.5188 GeV
- charge= 0
- name=*SigmaStarC0Bar*
- anti=*SigmaStarC0*

class LambdaCPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=4122
- mass=2.28646 GeV
- charge= 1
- name=*LambdaCPlus*
- anti=*LambdaCMinusBar*

class LambdaCMinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-4122
- mass=2.28646 GeV
- charge= -1
- name=*LambdaCMinusBar*
- anti=*LambdaCPlus*

class XiC0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=4132
- mass=2.47088 GeV
- charge= 0
- name=*XiC0*
- anti=*XiC0Bar*

class XiC0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-4132
- mass=2.47088 GeV
- charge= 0
- name=*XiC0Bar*
- anti=*XiC0*

class SigmaCPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=4212
- mass=2.4529 GeV
- charge= 1
- name=*SigmaCPlus*
- anti=*SigmaCMinusBar*

class SigmaCMinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-4212
- mass=2.4529 GeV
- charge= -1
- name=*SigmaCMinusBar*
- anti=*SigmaCPlus*

class SigmaStarCPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=4214
- mass=2.5175 GeV
- charge= 1
- name=*SigmaStarCPlus*
- anti=*SigmaStarCMinusBar*

class SigmaStarCMinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-4214
- mass=2.5175 GeV
- charge= -1

- name=*SigmaStarCMinusBar*
- anti=*SigmaStarCPlus*

class SigmaCPlusPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=4222
- mass=2.45398 GeV
- charge= 2
- name=*SigmaCPlusPlus*
- anti=*SigmaCMinusMinusBar*

class SigmaCMinusMinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-4222
- mass=2.45398 GeV
- charge= -2
- name=*SigmaCMinusMinusBar*
- anti=*SigmaCPlusPlus*

class SigmaStarCPlusPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=4224
- mass=2.5179 GeV
- charge= 2
- name=*SigmaStarCPlusPlus*
- anti=*SigmaStarCMinusMinusBar*

class SigmaStarCMinusMinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-4224
- mass=2.5179 GeV
- charge= -2
- name=*SigmaStarCMinusMinusBar*
- anti=*SigmaStarCPlusPlus*

class XiCPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=4232

- mass=2.4678 GeV
- charge= 1
- name=*XiCPlus*
- anti=*XiCMinusBar*

class XiCMinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-4232
- mass=2.4678 GeV
- charge= -1
- name=*XiCMinusBar*
- anti=*XiCPlus*

class XiPrimeC0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=4312
- mass=2.5779 GeV
- charge= 0
- name=*XiPrimeC0*
- anti=*XiPrimeC0Bar*

class XiPrimeC0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-4312
- mass=2.5779 GeV
- charge= 0
- name=*XiPrimeC0Bar*
- anti=*XiPrimeC0*

class XiStarC0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=4314
- mass=2.6459 GeV
- charge= 0
- name=*XiStarC0*
- anti=*XiStarC0Bar*

class XiStarC0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-4314
- mass=2.6459 GeV
- charge= 0
- name=*XiStarC0Bar*
- anti=*XiStarC0*

class XiPrimeCPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=4322
- mass=2.5756 GeV
- charge= 1
- name=*XiPrimeCPlus*
- anti=*XiPrimeCMinusBar*

class XiPrimeCMinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-4322
- mass=2.5756 GeV
- charge= -1
- name=*XiPrimeCMinusBar*
- anti=*XiPrimeCPlus*

class XiStarCPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=4324
- mass=2.6459 GeV
- charge= 1
- name=*XiStarCPlus*
- anti=*XiStarCMinusBar*

class XiStarCMinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-4324
- mass=2.6459 GeV
- charge= -1

- name=*XiStarCMinusBar*
- anti=*XiStarCPlus*

class OmegaC0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=4332
- mass=2.6952 GeV
- charge= 0
- name=*OmegaC0*
- anti=*OmegaC0Bar*

class OmegaC0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-4332
- mass=2.6952 GeV
- charge= 0
- name=*OmegaC0Bar*
- anti=*OmegaC0*

class SigmaBMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=5112
- mass=5.8155 GeV
- charge= -1
- name=*SigmaBMinus*
- anti=*SigmaBPlusBar*

class SigmaBPlusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-5112
- mass=5.8155 GeV
- charge= 1
- name=*SigmaBPlusBar*
- anti=*SigmaBMinus*

class LambdaB0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=5122

- mass=5.6194 GeV
- charge= 0
- name=*LambdaB0*
- anti=*LambdaB0Bar*

class LambdaB0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-5122
- mass=5.6194 GeV
- charge= 0
- name=*LambdaB0Bar*
- anti=*LambdaB0*

class XiBMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=5132
- mass=5.7911 GeV
- charge= -1
- name=*XiBMinus*
- anti=*XiBPlusBar*

class XiBPlusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-5132
- mass=5.7911 GeV
- charge= 1
- name=*XiBPlusBar*
- anti=*XiBMinus*

class SigmaBPlus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=5222
- mass=5.8113 GeV
- charge= 1
- name=*SigmaBPlus*
- anti=*SigmaBMinusBar*

class SigmaBMinusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=-5222`
- `mass=5.8113 GeV`
- `charge= -1`
- `name=SigmaBMinusBar`
- `anti=SigmaBPlus`

class XiB0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=5232`
- `mass=5.788 GeV`
- `charge= 0`
- `name=XiB0`
- `anti=XiB0Bar`

class XiB0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=-5232`
- `mass=5.788 GeV`
- `charge= 0`
- `name=XiB0Bar`
- `anti=XiB0`

class OmegaBMinus

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=5332`
- `mass=6.07 GeV`
- `charge= -1`
- `name=OmegaBMinus`
- `anti=OmegaBPlusBar`

class OmegaBPlusBar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- `pdg=-5332`
- `mass=6.07 GeV`
- `charge= 1`

- name=*OmegaBPlusBar*
- anti=*OmegaBMinus*

class Lambda1405_0

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=13122
- mass=1.4051 GeV
- charge= 0
- name=*Lambda1405_0*
- anti=*Lambda1405_0Bar*

class Lambda1405_0Bar

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=-13122
- mass=1.4051 GeV
- charge= 0
- name=*Lambda1405_0Bar*
- anti=*Lambda1405_0*

class Hydrogen

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000010010
- mass=0.9382720813 GeV
- charge= 1
- name=*Hydrogen*
- anti=*Unknown*
- nuclear A=1
- nuclear Z=1

class Deuterium

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000010020
- mass=1.8778374946 GeV
- charge= 1
- name=*Deuterium*
- anti=*Unknown*
- nuclear A=2

- nuclear Z=1

class Tritium

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000010030
- mass=2.8174029079 GeV
- charge= 1
- name=*Tritium*
- anti=*Unknown*
- nuclear A=3
- nuclear Z=1

class Helium

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000020040
- mass=3.7556749892 GeV
- charge= 2
- name=*Helium*
- anti=*Unknown*
- nuclear A=4
- nuclear Z=2

class Helium3

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000020030
- mass=2.8161095758999997 GeV
- charge= 2
- name=*Helium3*
- anti=*Unknown*
- nuclear A=3
- nuclear Z=2

class Lithium7

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000030070
- mass=6.573077897099999 GeV
- charge= 3

- name=*Lithium7*
- anti=*Unknown*
- nuclear A=7
- nuclear Z=3

class Beryllium9

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000040090
- mass=8.4509153917 GeV
- charge= 4
- name=*Beryllium9*
- anti=*Unknown*
- nuclear A=9
- nuclear Z=4

class Boron11

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000110050
- mass=10.328752886299998 GeV
- charge= 5
- name=*Boron11*
- anti=*Unknown*
- nuclear A=11
- nuclear Z=5

class Carbon

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000060120
- mass=11.2670249676 GeV
- charge= 6
- name=*Carbon*
- anti=*Unknown*
- nuclear A=12
- nuclear Z=6

class Carbon13

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000060130
- mass=12.2065903809 GeV
- charge= 6
- name=*Carbon13*
- anti=*Unknown*
- nuclear A=13
- nuclear Z=6

class Nitrogen

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000070140
- mass=13.144862462199999 GeV
- charge= 7
- name=*Nitrogen*
- anti=*Unknown*
- nuclear A=14
- nuclear Z=7

class Oxygen

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000080160
- mass=15.0226999568 GeV
- charge= 8
- name=*Oxygen*
- anti=*Unknown*
- nuclear A=16
- nuclear Z=8

class Fluor

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000080180
- mass=16.900537451399998 GeV
- charge= 9
- name=*Fluor*
- anti=*Unknown*
- nuclear A=18
- nuclear Z=9

class Neon21

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000100210
- mass=19.717940359299998 GeV
- charge= 10
- name=*Neon21*
- anti=*Unknown*
- nuclear A=21
- nuclear Z=10

class Neon

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000100220
- mass=20.657505772599997 GeV
- charge= 10
- name=*Neon*
- anti=*Unknown*
- nuclear A=22
- nuclear Z=10

class Sulphur

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000160330
- mass=30.9849653269 GeV
- charge= 16
- name=*Sulphur*
- anti=*Unknown*
- nuclear A=33
- nuclear Z=16

class Argon

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000180400
- mass=37.559336556 GeV
- charge= 18
- name=*Argon*

- anti=*Unknown*
- nuclear A=40
- nuclear Z=18

class Iron

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000280560
- mass=52.579449848799996 GeV
- charge= 28
- name=*Iron*
- anti=*Unknown*
- nuclear A=56
- nuclear Z=28

class Xenon

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000541280
- mass=120.19453297439999 GeV
- charge= 54
- name=*Xenon*
- anti=*Unknown*
- nuclear A=128
- nuclear Z=54

class Lead

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000822080
- mass=195.32355274239998 GeV
- charge= 82
- name=*Lead*
- anti=*Unknown*
- nuclear A=208
- nuclear Z=82

class Radon

Particle properties are taken from the PYTHIA8 ParticleData.xml file:

- pdg=1000862220

- mass=208.4722952006 GeV
- charge= 86
- name=*Radon*
- anti=*Unknown*
- nuclear A=222
- nuclear Z=86

group **Particles**

The properties of all particles are saved in static and flat arrays.

There is a enum `corsika::Code` to identify each particles, and each individual particles has its own static class, which can be used to retrieve its physical properties.

The properties of all elementary particles are accessible here. The data are taken from the Pythia Particle-Data.xml file.

Particle data can be accessed via global function in namespace `corsika`, or via static classes for each particle type. These classes all have the interface (example for the class `corsika::Electron`):

```
static constexpr Code code{Code::Electron};
static constexpr Code anti_code{Code::Positron};
static constexpr HEPMassType mass{corsika::get_mass(code)};
static constexpr ElectricChargeType charge{corsika::get_charge(code)};
static constexpr int charge_number{corsika::get_charge_number(code)};
static constexpr std::string_view name{corsika::get_name(code)};
static constexpr bool is_nucleus{corsika::is_nucleus(code)};
```

The names, relations and properties of all particles known to CORSIKA 8 are listed below.

Typedefs

CodeIntType = int32_t std::underlying_type< Code >::type

The Code enum is the actual place to define CORSIKA 8 particle codes.

Specifically for PDG ids

using PDGCodeType = std::underlying_type<PDGCode>::type

Functions

int16_t constexpr get_charge_number (Code const)

electric charge in units of e

ElectricChargeType constexpr get_charge (Code const)

electric charge

HEPMassType constexpr get_mass (Code const)

mass

HEPEnergyType constexpr get_energy_threshold (Code const)

get energy threshold below which the particle is discarded, by default set to particle mass

void constexpr set_energy_threshold (Code const, HEPEnergyType const)

set energy threshold below which the particle is discarded

```

inline void set_energy_threshold (std::pair<Code const, HEPEnergyType const> p)
inline void set_energy_thresholds (std::unordered_map<Code const, HEPEnergyType
                                     const> const &eCuts)

PDGCode constexpr get_PDG (Code const)
    Particle code according to PDG, “Monte Carlo Particle Numbering Scheme”.

std::string_view constexpr get_name (Code const)
    name of the particle as string

TimeType constexpr get_lifetime (Code const)
    lifetime

bool constexpr is_nucleus (Code const)
    true iff the particle is a hard-coded nucleus or Code::Nucleus

bool constexpr is_hadron (Code const)
    true iff particle is hadron

bool constexpr is_em (Code const)
    true iff particle is electron, positron or gamma

bool constexpr is_muon (Code const)
    true iff particle is mu+ or mu-

bool constexpr is_neutrino (Code const)
    true iff particle is (anti-) neutrino

int constexpr get_nucleus_A (Code const)
    returns A for hard-coded nucleus, otherwise 0

int constexpr get_nucleus_Z (Code const)
    returns Z for hard-coded nucleus, otherwise 0

HEPMassType get_nucleus_mass (unsigned int const, unsigned int const)
    returns mass of (A,Z) nucleus, disregarding binding energy

Code convert_from_PDG (PDGCode const)
    convert PDG code to CORSIKA 8 internal code

std::initializer_list<Code> constexpr get_all_particles ()

std::ostream &operator<< (std::ostream&, corsika::Code)
    the output stream operator for human-readable particle codes

```

MEDIA PROPERTIES

4.1 Media Classes

group **MediaPropertiesClasses**

list of C++ classes to access media properties

class HydrogenGas

Media properties from properties8.dat file from NIST:

- Sternheimer index: 1, label: Hydro, name: hydrogen_gas, nice_name: hydrogen gas (H%2#), symbol: H
- weight: 1.008, weight_significant_figure: 3, weight_error_last_digit: 7
- Z_over_A: 0.99212, sternheimhersh_density: 8.3748e-05, corrected_density: 8.3755e-05,
- State::DiatomicGas, MediumType::Element, Ieff=19.2, Cbar=9.5835, X0=1.8639, x1=3.2718, aa=0.14092, sk=5.7273, dlt0=0.0

class HeliumGasHe

Media properties from properties8.dat file from NIST:

- Sternheimer index: 2, label: Helium, name: helium_gas_He, nice_name: helium gas (He), symbol: He
- weight: 4.002602, weight_significant_figure: 6, weight_error_last_digit: 2
- Z_over_A: 0.49967, sternheimhersh_density: 0.00016632, corrected_density: 0.00016632,
- State::Gas, MediumType::Element, Ieff=41.8, Cbar=11.1393, X0=2.2017, x1=3.6122, aa=0.13443, sk=5.8347, dlt0=0.0

class LithiumLi

Media properties from properties8.dat file from NIST:

- Sternheimer index: 3, label: Lithium, name: lithium_Li, nice_name: lithium (Li), symbol: Li
- weight: 6.94, weight_significant_figure: 2, weight_error_last_digit: 2
- Z_over_A: 0.43221, sternheimhersh_density: 0.534, corrected_density: 0.534,
- State::Solid, MediumType::Element, Ieff=40.0, Cbar=3.1221, X0=0.1304, x1=1.6397, aa=0.95136, sk=2.4993, dlt0=0.14

class BerylliumBe

Media properties from properties8.dat file from NIST:

- Sternheimer index: 4, label: Beryl, name: beryllium_Be, nice_name: beryllium (Be), symbol: Be
- weight: 9.0121831, weight_significant_figure: 7, weight_error_last_digit: 5
- Z_over_A: 0.44384, sternheimhershers_density: 1.848, corrected_density: 1.848,
- State::Solid, MediumType::Element, Ieff=63.7, Cbar=2.7847, X0=0.0592, x1=1.6922, aa=0.80392, sk=2.4339, dlt0=0.14

class BoronB

Media properties from properties8.dat file from NIST:

- Sternheimer index: 5, label: Boron, name: boron_B, nice_name: boron (B), symbol: B
- weight: 10.81, weight_significant_figure: 2, weight_error_last_digit: 7
- Z_over_A: 0.46249, sternheimhershers_density: 2.37, corrected_density: 2.37,
- State::Solid, MediumType::Element, Ieff=76.0, Cbar=2.8477, X0=0.0305, x1=1.9688, aa=0.56224, sk=2.4512, dlt0=0.14

class CarbonAmorphousC

Media properties from properties8.dat file from NIST:

- Sternheimer index: 6, label: Carbo, name: carbon_amorphous_C, nice_name: carbon (amorphous) (C), symbol: C
- weight: 12.0107, weight_significant_figure: 4, weight_error_last_digit: 8
- Z_over_A: 0.49955, sternheimhershers_density: 2.0, corrected_density: 2.0,
- State::Solid, MediumType::Element, Ieff=78.0, Cbar=2.9925, X0=-0.0351, x1=2.486, aa=0.2024, sk=3.0036, dlt0=0.1

class NitrogenGas

Media properties from properties8.dat file from NIST:

- Sternheimer index: 7, label: Nitro, name: nitrogen_gas, nice_name: nitrogen gas (N%2#), symbol: N
- weight: 14.007, weight_significant_figure: 3, weight_error_last_digit: 2
- Z_over_A: 0.49976, sternheimhershers_density: 0.0011653, corrected_density: 0.0011653,
- State::DiatomicGas, MediumType::Element, Ieff=82.0, Cbar=10.54, X0=1.7378, x1=4.1323, aa=0.15349, sk=3.2125, dlt0=0.0

class OxygenGas

Media properties from properties8.dat file from NIST:

- Sternheimer index: 8, label: Oxyge, name: oxygen_gas, nice_name: oxygen gas (O%2#), symbol: O
- weight: 15.999, weight_significant_figure: 3, weight_error_last_digit: 3
- Z_over_A: 0.50002, sternheimhershers_density: 0.0013315, corrected_density: 0.0013315,

- State::DiatomicGas, MediumType::Element, Ieff=95.0, Cbar=10.7004, X0=1.7541, x1=4.3213, aa=0.11778, sk=3.2913, dlt0=0.0

class FluorineGas

Media properties from properties8.dat file from NIST:

- Sternheimer index: 9, label: *Fluor*, name: fluorine_gas, nice_name: fluorine gas (F%2#), symbol: F
- weight: 18.998403163, weight_significant_figure: 9, weight_error_last_digit: 6
- Z_over_A: 0.47372, sternheimhersh_density: 0.0015803, corrected_density: 0.0015803,
- State::DiatomicGas, MediumType::Element, Ieff=115.0, Cbar=10.9653, X0=1.8433, x1=4.4096, aa=0.11083, sk=3.2962, dlt0=0.0

class NeonGasNe

Media properties from properties8.dat file from NIST:

- Sternheimer index: 10, label: *Neon*, name: neon_gas_Ne, nice_name: neon gas (Ne), symbol: Ne
- weight: 20.1797, weight_significant_figure: 4, weight_error_last_digit: 6
- Z_over_A: 0.49555, sternheimhersh_density: 0.00083851, corrected_density: 0.00083851,
- State::Gas, MediumType::Element, Ieff=137.0, Cbar=11.9041, X0=2.0735, x1=4.6421, aa=0.08064, sk=3.5771, dlt0=0.0

class SodiumNa

Media properties from properties8.dat file from NIST:

- Sternheimer index: 11, label: Sodiun, name: sodium_Na, nice_name: sodium (Na), symbol: Na
- weight: 22.98976928, weight_significant_figure: 8, weight_error_last_digit: 2
- Z_over_A: 0.47847, sternheimhersh_density: 0.971, corrected_density: 0.971,
- State::Solid, MediumType::Element, Ieff=149.0, Cbar=5.0526, X0=0.288, x1=3.1962, aa=0.07772, sk=3.6452, dlt0=0.08

class MagnesiumMg

Media properties from properties8.dat file from NIST:

- Sternheimer index: 12, label: Magne, name: magnesium_Mg, nice_name: magnesium (Mg), symbol: Mg
- weight: 24.305, weight_significant_figure: 3, weight_error_last_digit: 6
- Z_over_A: 0.49373, sternheimhersh_density: 1.74, corrected_density: 1.74,
- State::Solid, MediumType::Element, Ieff=156.0, Cbar=4.5297, X0=0.1499, x1=3.0668, aa=0.08163, sk=3.6166, dlt0=0.08

class AluminumAl

Media properties from properties8.dat file from NIST:

- Sternheimer index: 13, label: Alumi, name: aluminum_Al, nice_name: aluminum (Al), symbol: Al
- weight: 26.9815385, weight_significant_figure: 7, weight_error_last_digit: 7

- Z_over_A: 0.48181, sternheimhersh_density: 2.6989, corrected_density: 2.6989,
- State::Solid, MediumType::Element, Ieff=166.0, Cbar=4.2395, X0=0.1708, x1=3.0127, aa=0.08024, sk=3.6345, dlt0=0.12

class SiliconSi

Media properties from properties8.dat file from NIST:

- Sternheimer index: 14, label: Silic, name: silicon_Si, nice_name: silicon (Si), symbol: Si
- weight: 28.0855, weight_significant_figure: 4, weight_error_last_digit: 3
- Z_over_A: 0.49848, sternheimhersh_density: 2.33, corrected_density: 2.329,
- State::Solid, MediumType::Element, Ieff=173.0, Cbar=4.4351, X0=0.2014, x1=2.8715, aa=0.14921, sk=3.2546, dlt0=0.14

class PhosphorusP

Media properties from properties8.dat file from NIST:

- Sternheimer index: 15, label: Phosp, name: phosphorus_P, nice_name: phosphorus (P), symbol: P
- weight: 30.973761998, weight_significant_figure: 9, weight_error_last_digit: 5
- Z_over_A: 0.48428, sternheimhersh_density: 2.2, corrected_density: 2.2,
- State::Solid, MediumType::Element, Ieff=173.0, Cbar=4.5214, X0=0.1696, x1=2.7815, aa=0.2361, sk=2.9158, dlt0=0.14

class SulfurS

Media properties from properties8.dat file from NIST:

- Sternheimer index: 16, label: Sulfu, name: sulfur_S, nice_name: sulfur (S), symbol: S
- weight: 32.065, weight_significant_figure: 3, weight_error_last_digit: 5
- Z_over_A: 0.49899, sternheimhersh_density: 2.0, corrected_density: 2.0,
- State::Solid, MediumType::Element, Ieff=180.0, Cbar=4.6659, X0=0.158, x1=2.7159, aa=0.33992, sk=2.6456, dlt0=0.14

class ChlorineGas

Media properties from properties8.dat file from NIST:

- Sternheimer index: 17, label: Chlor, name: chlorine_gas, nice_name: chlorine gas (Cl%2#), symbol: Cl
- weight: 35.453, weight_significant_figure: 3, weight_error_last_digit: 2
- Z_over_A: 0.47951, sternheimhersh_density: 0.0029947, corrected_density: 0.00298,
- State::DiatomicGas, MediumType::Element, Ieff=174.0, Cbar=11.1421, X0=1.5555, x1=4.2994, aa=0.19849, sk=2.9702, dlt0=0.0

class ArgonGasAr

Media properties from properties8.dat file from NIST:

- Sternheimer index: 18, label: *Argon*, name: argon_gas_Ar, nice_name: argon gas (Ar), symbol: Ar

- weight: 39.948, weight_significant_figure: 3, weight_error_last_digit: 1
- Z_over_A: 0.45059, sternheimhersh_density: 0.001662, corrected_density: 0.001662,
- State::Gas, MediumType::Element, Ieff=188.0, Cbar=11.948, X0=1.7635, x1=4.4855, aa=0.19714, sk=2.9618, dlt0=0.0

class PotassiumK

Media properties from properties8.dat file from NIST:

- Sternheimer index: 19, label: Potas, name: potassium_K, nice_name: potassium (K), symbol: K
- weight: 39.0983, weight_significant_figure: 4, weight_error_last_digit: 1
- Z_over_A: 0.48595, sternheimhersh_density: 0.862, corrected_density: 0.862,
- State::Solid, MediumType::Element, Ieff=190.0, Cbar=5.6423, X0=0.3851, x1=3.1724, aa=0.19827, sk=2.9233, dlt0=0.1

class CalciumCa

Media properties from properties8.dat file from NIST:

- Sternheimer index: 20, label: Calci, name: calcium_Ca, nice_name: calcium (Ca), symbol: Ca
- weight: 40.078, weight_significant_figure: 3, weight_error_last_digit: 4
- Z_over_A: 0.49903, sternheimhersh_density: 1.55, corrected_density: 1.55,
- State::Solid, MediumType::Element, Ieff=191.0, Cbar=5.0396, X0=0.3228, x1=3.1191, aa=0.15643, sk=3.0745, dlt0=0.14

class ScandiumSc

Media properties from properties8.dat file from NIST:

- Sternheimer index: 21, label: Scand, name: scandium_Sc, nice_name: scandium (Sc), symbol: Sc
- weight: 44.955908, weight_significant_figure: 6, weight_error_last_digit: 5
- Z_over_A: 0.46712, sternheimhersh_density: 2.989, corrected_density: 2.989,
- State::Solid, MediumType::Element, Ieff=216.0, Cbar=4.6949, X0=0.164, x1=3.0593, aa=0.15754, sk=3.0517, dlt0=0.1

class TitaniumTi

Media properties from properties8.dat file from NIST:

- Sternheimer index: 22, label: Titan, name: titanium_Ti, nice_name: titanium (Ti), symbol: Ti
- weight: 47.867, weight_significant_figure: 3, weight_error_last_digit: 1
- Z_over_A: 0.45961, sternheimhersh_density: 4.54, corrected_density: 4.54,
- State::Solid, MediumType::Element, Ieff=233.0, Cbar=4.445, X0=0.0957, x1=3.0386, aa=0.15662, sk=3.0302, dlt0=0.12

class VanadiumV

Media properties from properties8.dat file from NIST:

- Sternheimer index: 23, label: Vanad, name: vanadium_V, nice_name: vanadium (V), symbol: V
- weight: 50.9415, weight_significant_figure: 4, weight_error_last_digit: 1
- Z_over_A: 0.4515, sternheimhersh_density: 6.11, corrected_density: 6.11,
- State::Solid, MediumType::Element, Ieff=245.0, Cbar=4.2659, X0=0.0691, x1=3.0322, aa=0.15436, sk=3.0163, dlt0=0.14

class ChromiumCr

Media properties from properties8.dat file from NIST:

- Sternheimer index: 24, label: Chrom, name: chromium_Cr, nice_name: chromium (Cr), symbol: Cr
- weight: 51.9961, weight_significant_figure: 4, weight_error_last_digit: 6
- Z_over_A: 0.46157, sternheimhersh_density: 7.18, corrected_density: 7.18,
- State::Solid, MediumType::Element, Ieff=257.0, Cbar=4.1781, X0=0.034, x1=3.0451, aa=0.15419, sk=2.9896, dlt0=0.14

class ManganeseMn

Media properties from properties8.dat file from NIST:

- Sternheimer index: 25, label: Manga, name: manganese_Mn, nice_name: manganese (Mn), symbol: Mn
- weight: 54.938044, weight_significant_figure: 6, weight_error_last_digit: 3
- Z_over_A: 0.45506, sternheimhersh_density: 7.44, corrected_density: 7.44,
- State::Solid, MediumType::Element, Ieff=272.0, Cbar=4.2702, X0=0.0447, x1=3.1074, aa=0.14973, sk=2.9796, dlt0=0.14

class IronFe

Media properties from properties8.dat file from NIST:

- Sternheimer index: 26, label: *Iron*, name: iron_Fe, nice_name: iron (Fe), symbol: Fe
- weight: 55.845, weight_significant_figure: 3, weight_error_last_digit: 2
- Z_over_A: 0.46557, sternheimhersh_density: 7.874, corrected_density: 7.874,
- State::Solid, MediumType::Element, Ieff=286.0, Cbar=4.2911, X0=-0.0012, x1=3.1531, aa=0.1468, sk=2.9632, dlt0=0.12

class CobaltCo

Media properties from properties8.dat file from NIST:

- Sternheimer index: 27, label: Cobal, name: cobalt_Co, nice_name: cobalt (Co), symbol: Co
- weight: 58.933194, weight_significant_figure: 6, weight_error_last_digit: 4
- Z_over_A: 0.45815, sternheimhersh_density: 8.9, corrected_density: 8.9,
- State::Solid, MediumType::Element, Ieff=297.0, Cbar=4.2601, X0=-0.0187, x1=3.179, aa=0.14474, sk=2.9502, dlt0=0.12

class NickelNi

Media properties from properties8.dat file from NIST:

- Sternheimer index: 28, label: Nicke, name: nickel_Ni, nice_name: nickel (Ni), symbol: Ni
- weight: 58.6934, weight_significant_figure: 4, weight_error_last_digit: 4
- Z_over_A: 0.47706, sternheimhders_density: 8.902, corrected_density: 8.902,
- State::Solid, MediumType::Element, Ieff=311.0, Cbar=4.3115, X0=-0.0566, x1=3.1851, aa=0.16496, sk=2.843, dlt0=0.1

class CopperCu

Media properties from properties8.dat file from NIST:

- Sternheimer index: 29, label: Coppe, name: copper_Cu, nice_name: copper (Cu), symbol: Cu
- weight: 63.546, weight_significant_figure: 3, weight_error_last_digit: 3
- Z_over_A: 0.45636, sternheimhders_density: 8.96, corrected_density: 8.96,
- State::Solid, MediumType::Element, Ieff=322.0, Cbar=4.419, X0=-0.0254, x1=3.2792, aa=0.14339, sk=2.9044, dlt0=0.08

class ZincZn

Media properties from properties8.dat file from NIST:

- Sternheimer index: 30, label: Zinc, name: zinc_Zn, nice_name: zinc (Zn), symbol: Zn
- weight: 65.38, weight_significant_figure: 2, weight_error_last_digit: 2
- Z_over_A: 0.45886, sternheimhders_density: 7.133, corrected_density: 7.133,
- State::Solid, MediumType::Element, Ieff=330.0, Cbar=4.6906, X0=0.0049, x1=3.3668, aa=0.14714, sk=2.8652, dlt0=0.08

class GalliumGa

Media properties from properties8.dat file from NIST:

- Sternheimer index: 31, label: Galli, name: gallium_Ga, nice_name: gallium (Ga), symbol: Ga
- weight: 69.723, weight_significant_figure: 3, weight_error_last_digit: 1
- Z_over_A: 0.44462, sternheimhders_density: 5.904, corrected_density: 5.904,
- State::Solid, MediumType::Element, Ieff=334.0, Cbar=4.9353, X0=0.2267, x1=3.5434, aa=0.0944, sk=3.1314, dlt0=0.14

class GermaniumGe

Media properties from properties8.dat file from NIST:

- Sternheimer index: 32, label: Germa, name: germanium_Ge, nice_name: germanium (Ge), symbol: Ge
- weight: 72.63, weight_significant_figure: 3, weight_error_last_digit: 1
- Z_over_A: 0.44053, sternheimhders_density: 5.323, corrected_density: 5.323,

- State::Solid, MediumType::Element, Ieff=350.0, Cbar=5.1411, X0=0.3376, x1=3.6096, aa=0.07188, sk=3.3306, dlt0=0.14

class ArsenicAs

Media properties from properties8.dat file from NIST:

- Sternheimer index: 33, label: Arsen, name: arsenic_As, nice_name: arsenic (As), symbol: As
- weight: 74.921595, weight_significant_figure: 6, weight_error_last_digit: 6
- Z_over_A: 0.44046, sternheimhersh_density: 5.73, corrected_density: 5.73,
- State::Solid, MediumType::Element, Ieff=347.0, Cbar=5.051, X0=0.1767, x1=3.5702, aa=0.06633, sk=3.4176, dlt0=0.08

class SeleniumSe

Media properties from properties8.dat file from NIST:

- Sternheimer index: 34, label: Selen, name: selenium_Se, nice_name: selenium (Se), symbol: Se
- weight: 78.971, weight_significant_figure: 3, weight_error_last_digit: 8
- Z_over_A: 0.4306, sternheimhersh_density: 4.5, corrected_density: 4.5,
- State::Solid, MediumType::Element, Ieff=348.0, Cbar=5.321, X0=0.2258, x1=3.6264, aa=0.06568, sk=3.4317, dlt0=0.1

class BromineGas

Media properties from properties8.dat file from NIST:

- Sternheimer index: 35, label: Bromi, name: bromine_gas, nice_name: bromine gas (Br%2#), symbol: Br
- weight: 79.904, weight_significant_figure: 3, weight_error_last_digit: 1
- Z_over_A: 0.43803, sternheimhersh_density: 0.0070722, corrected_density: 0.0070722,
- State::DiatomicGas, MediumType::Element, Ieff=343.0, Cbar=11.7307, X0=1.5262, x1=4.9899, aa=0.06335, sk=3.467, dlt0=0.0

class KryptonGasKr

Media properties from properties8.dat file from NIST:

- Sternheimer index: 36, label: Krypt, name: krypton_gas_Kr, nice_name: krypton gas (Kr), symbol: Kr
- weight: 83.798, weight_significant_figure: 3, weight_error_last_digit: 2
- Z_over_A: 0.4296, sternheimhersh_density: 0.0034783, corrected_density: 0.0034856,
- State::Gas, MediumType::Element, Ieff=352.0, Cbar=12.5115, X0=1.7158, x1=5.0748, aa=0.07446, sk=3.4051, dlt0=0.0

class RubidiumRb

Media properties from properties8.dat file from NIST:

- Sternheimer index: 37, label: Rubid, name: rubidium_Rb, nice_name: rubidium (Rb), symbol: Rb

- weight: 85.4678, weight_significant_figure: 4, weight_error_last_digit: 3
- Z_over_A: 0.43291, sternheimhersh_density: 1.532, corrected_density: 1.532,
- State::Solid, MediumType::Element, Ieff=363.0, Cbar=6.4776, X0=0.5737, x1=3.7995, aa=0.07261, sk=3.4177, dlt0=0.14

class StrontiumSr

Media properties from properties8.dat file from NIST:

- Sternheimer index: 38, label: Stron, name: strontium_Sr, nice_name: strontium (Sr), symbol: Sr
- weight: 87.62, weight_significant_figure: 2, weight_error_last_digit: 1
- Z_over_A: 0.43369, sternheimhersh_density: 2.54, corrected_density: 2.54,
- State::Solid, MediumType::Element, Ieff=366.0, Cbar=5.9867, X0=0.4585, x1=3.6778, aa=0.07165, sk=3.4435, dlt0=0.14

class YttriumY

Media properties from properties8.dat file from NIST:

- Sternheimer index: 39, label: Yttri, name: yttrium_Y, nice_name: yttrium (Y), symbol: Y
- weight: 88.90584, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.43867, sternheimhersh_density: 4.469, corrected_density: 4.469,
- State::Solid, MediumType::Element, Ieff=379.0, Cbar=5.4801, X0=0.3608, x1=3.5542, aa=0.07138, sk=3.4585, dlt0=0.14

class ZirconiumZr

Media properties from properties8.dat file from NIST:

- Sternheimer index: 40, label: Zirco, name: zirconium_Zr, nice_name: zirconium (Zr), symbol: Zr
- weight: 91.224, weight_significant_figure: 3, weight_error_last_digit: 2
- Z_over_A: 0.43848, sternheimhersh_density: 6.506, corrected_density: 6.506,
- State::Solid, MediumType::Element, Ieff=393.0, Cbar=5.1774, X0=0.2957, x1=3.489, aa=0.07177, sk=3.4533, dlt0=0.14

class NiobiumNb

Media properties from properties8.dat file from NIST:

- Sternheimer index: 41, label: Niobi, name: niobium_Nb, nice_name: niobium (Nb), symbol: Nb
- weight: 92.90637, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.4413, sternheimhersh_density: 8.57, corrected_density: 8.57,
- State::Solid, MediumType::Element, Ieff=417.0, Cbar=5.0141, X0=0.1785, x1=3.2201, aa=0.13883, sk=3.093, dlt0=0.14

class MolybdenumMo

Media properties from properties8.dat file from NIST:

- Sternheimer index: 42, label: Molyb, name: molybdenum_Mo, nice_name: molybdenum (Mo), symbol: Mo
- weight: 95.95, weight_significant_figure: 2, weight_error_last_digit: 1
- Z_over_A: 0.43768, sternheimhersh_density: 10.22, corrected_density: 10.22,
- State::Solid, MediumType::Element, Ieff=424.0, Cbar=4.8793, X0=0.2267, x1=3.2784, aa=0.10525, sk=3.2549, dlt0=0.14

class TechnetiumTc

Media properties from properties8.dat file from NIST:

- Sternheimer index: 43, label: Techn, name: technetium_Tc, nice_name: technetium (Tc), symbol: Tc
- weight: 97.90722, weight_significant_figure: 5, weight_error_last_digit: 3
- Z_over_A: 0.43919, sternheimhersh_density: 11.5, corrected_density: 11.5,
- State::Solid, MediumType::RadioactiveElement, Ieff=428.0, Cbar=4.7769, X0=0.0949, x1=3.1253, aa=0.16572, sk=2.9738, dlt0=0.14

class RutheniumRu

Media properties from properties8.dat file from NIST:

- Sternheimer index: 44, label: Ruthe, name: ruthenium_Ru, nice_name: ruthenium (Ru), symbol: Ru
- weight: 101.07, weight_significant_figure: 2, weight_error_last_digit: 2
- Z_over_A: 0.43534, sternheimhersh_density: 12.41, corrected_density: 12.41,
- State::Solid, MediumType::Element, Ieff=441.0, Cbar=4.7694, X0=0.0599, x1=3.0834, aa=0.19342, sk=2.8707, dlt0=0.14

class RhodiumRh

Media properties from properties8.dat file from NIST:

- Sternheimer index: 45, label: Rhodi, name: rhodium_Rh, nice_name: rhodium (Rh), symbol: Rh
- weight: 102.9055, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.43729, sternheimhersh_density: 12.41, corrected_density: 12.41,
- State::Solid, MediumType::Element, Ieff=449.0, Cbar=4.8008, X0=0.0576, x1=3.1069, aa=0.19205, sk=2.8633, dlt0=0.14

class PalladiumPd

Media properties from properties8.dat file from NIST:

- Sternheimer index: 46, label: Palla, name: palladium_Pd, nice_name: palladium (Pd), symbol: Pd
- weight: 106.42, weight_significant_figure: 2, weight_error_last_digit: 1
- Z_over_A: 0.43225, sternheimhersh_density: 12.02, corrected_density: 12.02,
- State::Solid, MediumType::Element, Ieff=470.0, Cbar=4.9358, X0=0.0563, x1=3.0555, aa=0.24178, sk=2.7239, dlt0=0.14

class SilverAg

Media properties from properties8.dat file from NIST:

- Sternheimer index: 47, label: Silve, name: silver_Ag, nice_name: silver (Ag), symbol: Ag
- weight: 107.8682, weight_significant_figure: 4, weight_error_last_digit: 2
- Z_over_A: 0.43572, sternheimhersh_density: 10.5, corrected_density: 10.5,
- State::Solid, MediumType::Element, Ieff=470.0, Cbar=5.063, X0=0.0657, x1=3.1074, aa=0.24585, sk=2.6899, dlt0=0.14

class CadmiumCd

Media properties from properties8.dat file from NIST:

- Sternheimer index: 48, label: Cadmi, name: cadmium_Cd, nice_name: cadmium (Cd), symbol: Cd
- weight: 112.414, weight_significant_figure: 3, weight_error_last_digit: 4
- Z_over_A: 0.427, sternheimhersh_density: 8.65, corrected_density: 8.65,
- State::Solid, MediumType::Element, Ieff=469.0, Cbar=5.2727, X0=0.1281, x1=3.1667, aa=0.24609, sk=2.6772, dlt0=0.14

class IndiumIn

Media properties from properties8.dat file from NIST:

- Sternheimer index: 49, label: Indiu, name: indium_In, nice_name: indium (In), symbol: In
- weight: 114.818, weight_significant_figure: 3, weight_error_last_digit: 3
- Z_over_A: 0.42676, sternheimhersh_density: 7.31, corrected_density: 7.31,
- State::Solid, MediumType::Element, Ieff=488.0, Cbar=5.5211, X0=0.2406, x1=3.2032, aa=0.23879, sk=2.7144, dlt0=0.14

class TinSn

Media properties from properties8.dat file from NIST:

- Sternheimer index: 50, label: Tin, name: tin_Sn, nice_name: tin (Sn), symbol: Sn
- weight: 118.71, weight_significant_figure: 3, weight_error_last_digit: 7
- Z_over_A: 0.42119, sternheimhersh_density: 7.31, corrected_density: 7.31,
- State::Solid, MediumType::Element, Ieff=488.0, Cbar=5.534, X0=0.2879, x1=3.2959, aa=0.18689, sk=2.8576, dlt0=0.14

class AntimonySb

Media properties from properties8.dat file from NIST:

- Sternheimer index: 51, label: Antim, name: antimony_Sb, nice_name: antimony (Sb), symbol: Sb
- weight: 121.76, weight_significant_figure: 3, weight_error_last_digit: 1
- Z_over_A: 0.41886, sternheimhersh_density: 6.691, corrected_density: 6.691,

- State::Solid, MediumType::Element, Ieff=487.0, Cbar=5.6241, X0=0.3189, x1=3.3489, aa=0.16652, sk=2.9319, dlt0=0.14

class TelluriumTe

Media properties from properties8.dat file from NIST:

- Sternheimer index: 52, label: Tellu, name: tellurium_Te, nice_name: tellurium (Te), symbol: Te
- weight: 127.6, weight_significant_figure: 2, weight_error_last_digit: 3
- Z_over_A: 0.40752, sternheimhersh_density: 6.24, corrected_density: 6.24,
- State::Solid, MediumType::Element, Ieff=485.0, Cbar=5.7131, X0=0.3296, x1=3.4418, aa=0.13815, sk=3.0354, dlt0=0.14

class IodineI

Media properties from properties8.dat file from NIST:

- Sternheimer index: 53, label: Iodin, name: iodine_I, nice_name: iodine (I), symbol: I
- weight: 126.90447, weight_significant_figure: 5, weight_error_last_digit: 3
- Z_over_A: 0.41764, sternheimhersh_density: 4.93, corrected_density: 4.93,
- State::Solid, MediumType::Element, Ieff=491.0, Cbar=5.9488, X0=0.0549, x1=3.2596, aa=0.23766, sk=2.7276, dlt0=0.0

class XenonGasXe

Media properties from properties8.dat file from NIST:

- Sternheimer index: 54, label: *Xenon*, name: xenon_gas_Xe, nice_name: xenon gas (Xe), symbol: Xe
- weight: 131.293, weight_significant_figure: 3, weight_error_last_digit: 6
- Z_over_A: 0.41129, sternheimhersh_density: 0.0054854, corrected_density: 0.005483,
- State::Gas, MediumType::Element, Ieff=482.0, Cbar=12.7281, X0=1.563, x1=4.7371, aa=0.23314, sk=2.7414, dlt0=0.0

class CaesiumCs

Media properties from properties8.dat file from NIST:

- Sternheimer index: 55, label: Caesi, name: caesium_Cs, nice_name: caesium (Cs), symbol: Cs
- weight: 132.90545196, weight_significant_figure: 8, weight_error_last_digit: 6
- Z_over_A: 0.41383, sternheimhersh_density: 1.873, corrected_density: 1.873,
- State::Solid, MediumType::Element, Ieff=488.0, Cbar=6.9135, X0=0.5473, x1=3.5914, aa=0.18233, sk=2.8866, dlt0=0.14

class BariumBa

Media properties from properties8.dat file from NIST:

- Sternheimer index: 56, label: Bariu, name: barium_Ba, nice_name: barium (Ba), symbol: Ba
- weight: 137.327, weight_significant_figure: 3, weight_error_last_digit: 7

- Z_over_A: 0.40779, sternheimhersh_density: 3.5, corrected_density: 3.5,
- State::Solid, MediumType::Element, Ieff=491.0, Cbar=6.3153, X0=0.419, x1=3.4547, aa=0.18268, sk=2.8906, dlt0=0.14

class LanthanumLa

Media properties from properties8.dat file from NIST:

- Sternheimer index: 57, label: Lanth, name: lanthanum_La, nice_name: lanthanum (La), symbol: La
- weight: 138.90547, weight_significant_figure: 5, weight_error_last_digit: 7
- Z_over_A: 0.41035, sternheimhersh_density: 6.154, corrected_density: 6.145,
- State::Solid, MediumType::Element, Ieff=501.0, Cbar=5.785, X0=0.3161, x1=3.3293, aa=0.18591, sk=2.8828, dlt0=0.14

class CeriumCe

Media properties from properties8.dat file from NIST:

- Sternheimer index: 58, label: Ceriu, name: cerium_Ce, nice_name: cerium (Ce), symbol: Ce
- weight: 140.116, weight_significant_figure: 3, weight_error_last_digit: 1
- Z_over_A: 0.41394, sternheimhersh_density: 6.657, corrected_density: 6.77,
- State::Solid, MediumType::Element, Ieff=523.0, Cbar=5.7837, X0=0.2713, x1=3.3432, aa=0.18885, sk=2.8592, dlt0=0.14

class PraseodymiumPr

Media properties from properties8.dat file from NIST:

- Sternheimer index: 59, label: Prase, name: praseodymium_Pr, nice_name: praseodymium (Pr), symbol: Pr
- weight: 140.90766, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.41871, sternheimhersh_density: 6.71, corrected_density: 6.773,
- State::Solid, MediumType::Element, Ieff=535.0, Cbar=5.8096, X0=0.2333, x1=3.2773, aa=0.23265, sk=2.7331, dlt0=0.14

class NeodymiumNd

Media properties from properties8.dat file from NIST:

- Sternheimer index: 60, label: Neody, name: neodymium_Nd, nice_name: neodymium (Nd), symbol: Nd
- weight: 144.242, weight_significant_figure: 3, weight_error_last_digit: 3
- Z_over_A: 0.41597, sternheimhersh_density: 6.9, corrected_density: 7.008,
- State::Solid, MediumType::Element, Ieff=546.0, Cbar=5.829, X0=0.1984, x1=3.3063, aa=0.2353, sk=2.705, dlt0=0.14

class PromethiumPm

Media properties from properties8.dat file from NIST:

- Sternheimer index: 61, label: Prome, name: promethium_Pm, nice_name: promethium (Pm), symbol: Pm
- weight: 144.91275, weight_significant_figure: 5, weight_error_last_digit: 3
- Z_over_A: 0.42094, sternheimhersh_density: 7.22, corrected_density: 7.264,
- State::Solid, MediumType::RadioactiveElement, Ieff=560.0, Cbar=5.8224, X0=0.1627, x1=3.3199, aa=0.2428, sk=2.6674, dlt0=0.14

class SamariumSm

Media properties from properties8.dat file from NIST:

- Sternheimer index: 62, label: Samar, name: samarium_Sm, nice_name: samarium (Sm), symbol: Sm
- weight: 150.36, weight_significant_figure: 2, weight_error_last_digit: 2
- Z_over_A: 0.41234, sternheimhersh_density: 7.46, corrected_density: 7.52,
- State::Solid, MediumType::Element, Ieff=574.0, Cbar=5.8597, X0=0.152, x1=3.346, aa=0.24698, sk=2.6403, dlt0=0.14

class EuropiumEu

Media properties from properties8.dat file from NIST:

- Sternheimer index: 63, label: Europ, name: europium_Eu, nice_name: europium (Eu), symbol: Eu
- weight: 151.964, weight_significant_figure: 3, weight_error_last_digit: 1
- Z_over_A: 0.41457, sternheimhersh_density: 5.243, corrected_density: 5.244,
- State::Solid, MediumType::Element, Ieff=580.0, Cbar=6.2278, X0=0.1888, x1=3.4633, aa=0.24448, sk=2.6245, dlt0=0.14

class GadoliniumGd

Media properties from properties8.dat file from NIST:

- Sternheimer index: 64, label: Gadol, name: gadolinium_Gd, nice_name: gadolinium (Gd), symbol: Gd
- weight: 157.25, weight_significant_figure: 2, weight_error_last_digit: 3
- Z_over_A: 0.407, sternheimhersh_density: 7.9004, corrected_density: 7.901,
- State::Solid, MediumType::Element, Ieff=591.0, Cbar=5.8738, X0=0.1058, x1=3.3932, aa=0.25109, sk=2.5977, dlt0=0.14

class TerbiumTb

Media properties from properties8.dat file from NIST:

- Sternheimer index: 65, label: Terbi, name: terbium_Tb, nice_name: terbium (Tb), symbol: Tb
- weight: 158.92535, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.409, sternheimhersh_density: 8.229, corrected_density: 8.23,
- State::Solid, MediumType::Element, Ieff=614.0, Cbar=5.9045, X0=0.0947, x1=3.4224, aa=0.24453, sk=2.6056, dlt0=0.14

class DysprosiumDy

Media properties from properties8.dat file from NIST:

- Sternheimer index: 66, label: Dyspr, name: dysprosium_Dy, nice_name: dysprosium (Dy), symbol: Dy
- weight: 162.5, weight_significant_figure: 3, weight_error_last_digit: 1
- Z_over_A: 0.40615, sternheimhersh_density: 8.55, corrected_density: 8.551,
- State::Solid, MediumType::Element, Ieff=628.0, Cbar=5.9183, X0=0.0822, x1=3.4474, aa=0.24665, sk=2.5849, dlt0=0.14

class HolmiumHo

Media properties from properties8.dat file from NIST:

- Sternheimer index: 67, label: Holmi, name: holmium_Ho, nice_name: holmium (Ho), symbol: Ho
- weight: 164.93033, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.40623, sternheimhersh_density: 8.795, corrected_density: 8.795,
- State::Solid, MediumType::Element, Ieff=650.0, Cbar=5.9587, X0=0.0761, x1=3.4782, aa=0.24638, sk=2.5726, dlt0=0.14

class ErbiumEr

Media properties from properties8.dat file from NIST:

- Sternheimer index: 68, label: Erbiu, name: erbium_Er, nice_name: erbium (Er), symbol: Er
- weight: 167.259, weight_significant_figure: 3, weight_error_last_digit: 3
- Z_over_A: 0.40656, sternheimhersh_density: 9.066, corrected_density: 9.026,
- State::Solid, MediumType::Element, Ieff=658.0, Cbar=5.9521, X0=0.0648, x1=3.4922, aa=0.24823, sk=2.5573, dlt0=0.14

class ThuliumTm

Media properties from properties8.dat file from NIST:

- Sternheimer index: 69, label: Thuli, name: thulium_Tm, nice_name: thulium (Tm), symbol: Tm
- weight: 168.93422, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.40844, sternheimhersh_density: 9.321, corrected_density: 9.321,
- State::Solid, MediumType::Element, Ieff=674.0, Cbar=5.9677, X0=0.0812, x1=3.5085, aa=0.24889, sk=2.5469, dlt0=0.14

class YtterbiumYb

Media properties from properties8.dat file from NIST:

- Sternheimer index: 70, label: Ytter, name: ytterbium_Yb, nice_name: ytterbium (Yb), symbol: Yb
- weight: 173.054, weight_significant_figure: 3, weight_error_last_digit: 5
- Z_over_A: 0.4045, sternheimhersh_density: 6.73, corrected_density: 6.903,

- State::Solid, MediumType::Element, Ieff=684.0, Cbar=6.3325, X0=0.1199, x1=3.6246, aa=0.25295, sk=2.5141, dlt0=0.14

class LutetiumLu

Media properties from properties8.dat file from NIST:

- Sternheimer index: 71, label: Lutet, name: lutetium_Lu, nice_name: lutetium (Lu), symbol: Lu
- weight: 174.9668, weight_significant_figure: 4, weight_error_last_digit: 1
- Z_over_A: 0.40579, sternheimhersch_density: 9.84, corrected_density: 9.841,
- State::Solid, MediumType::Element, Ieff=694.0, Cbar=5.9785, X0=0.156, x1=3.5218, aa=0.24033, sk=2.5643, dlt0=0.14

class HafniumHf

Media properties from properties8.dat file from NIST:

- Sternheimer index: 72, label: Hafni, name: hafnium_Hf, nice_name: hafnium (Hf), symbol: Hf
- weight: 178.49, weight_significant_figure: 2, weight_error_last_digit: 2
- Z_over_A: 0.40338, sternheimhersch_density: 13.31, corrected_density: 13.31,
- State::Solid, MediumType::Element, Ieff=705.0, Cbar=5.7139, X0=0.1965, x1=3.4337, aa=0.22918, sk=2.6155, dlt0=0.14

class TantalumTa

Media properties from properties8.dat file from NIST:

- Sternheimer index: 73, label: Tanta, name: tantalum_Ta, nice_name: tantalum (Ta), symbol: Ta
- weight: 180.94788, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.40343, sternheimhersch_density: 16.654, corrected_density: 16.654,
- State::Solid, MediumType::Element, Ieff=718.0, Cbar=5.5262, X0=0.2117, x1=3.4805, aa=0.17798, sk=2.7623, dlt0=0.14

class TungstenW

Media properties from properties8.dat file from NIST:

- Sternheimer index: 74, label: Tungs, name: tungsten_W, nice_name: tungsten (W), symbol: W
- weight: 183.84, weight_significant_figure: 2, weight_error_last_digit: 1
- Z_over_A: 0.40252, sternheimhersch_density: 19.3, corrected_density: 19.3,
- State::Solid, MediumType::Element, Ieff=727.0, Cbar=5.4059, X0=0.2167, x1=3.496, aa=0.15509, sk=2.8447, dlt0=0.14

class RheniumRe

Media properties from properties8.dat file from NIST:

- Sternheimer index: 75, label: Rheni, name: rhenium_Re, nice_name: rhenium (Re), symbol: Re
- weight: 186.207, weight_significant_figure: 3, weight_error_last_digit: 1

- Z_over_A: 0.40278, sternheimhersh_density: 21.02, corrected_density: 21.02,
- State::Solid, MediumType::Element, Ieff=736.0, Cbar=5.3445, X0=0.0559, x1=3.4845, aa=0.15184, sk=2.8627, dlt0=0.08

class OsmiumOs

Media properties from properties8.dat file from NIST:

- Sternheimer index: 76, label: Osmiu, name: osmium_Os, nice_name: osmium (Os), symbol: Os
- weight: 190.23, weight_significant_figure: 2, weight_error_last_digit: 3
- Z_over_A: 0.39952, sternheimhersh_density: 22.57, corrected_density: 22.57,
- State::Solid, MediumType::Element, Ieff=746.0, Cbar=5.3083, X0=0.0891, x1=3.5414, aa=0.12751, sk=2.9608, dlt0=0.1

class IridiumIr

Media properties from properties8.dat file from NIST:

- Sternheimer index: 77, label: Iridi, name: iridium_Ir, nice_name: iridium (Ir), symbol: Ir
- weight: 192.217, weight_significant_figure: 3, weight_error_last_digit: 3
- Z_over_A: 0.40059, sternheimhersh_density: 22.42, corrected_density: 22.42,
- State::Solid, MediumType::Element, Ieff=757.0, Cbar=5.3418, X0=0.0819, x1=3.548, aa=0.1269, sk=2.9658, dlt0=0.1

class PlatinumPt

Media properties from properties8.dat file from NIST:

- Sternheimer index: 78, label: Plati, name: platinum_Pt, nice_name: platinum (Pt), symbol: Pt
- weight: 195.084, weight_significant_figure: 3, weight_error_last_digit: 9
- Z_over_A: 0.39983, sternheimhersh_density: 21.45, corrected_density: 21.45,
- State::Solid, MediumType::Element, Ieff=790.0, Cbar=5.4732, X0=0.1484, x1=3.6212, aa=0.11128, sk=3.0417, dlt0=0.12

class GoldAu

Media properties from properties8.dat file from NIST:

- Sternheimer index: 79, label: Gold, name: gold_Au, nice_name: gold (Au), symbol: Au
- weight: 196.966569, weight_significant_figure: 6, weight_error_last_digit: 5
- Z_over_A: 0.40108, sternheimhersh_density: 19.32, corrected_density: 19.32,
- State::Solid, MediumType::Element, Ieff=790.0, Cbar=5.5747, X0=0.2021, x1=3.6979, aa=0.09756, sk=3.1101, dlt0=0.14

class MercuryHg

Media properties from properties8.dat file from NIST:

- Sternheimer index: 80, label: Mercu, name: mercury_Hg, nice_name: mercury (Hg), symbol: Hg

- weight: 200.592, weight_significant_figure: 3, weight_error_last_digit: 2
- Z_over_A: 0.39882, sternheimhersh_density: 13.546, corrected_density: 13.546,
- State::Liquid, MediumType::Element, Ieff=800.0, Cbar=5.9605, X0=0.2756, x1=3.7275, aa=0.11014, sk=3.0519, dlt0=0.14

class ThalliumTl

Media properties from properties8.dat file from NIST:

- Sternheimer index: 81, label: Thall, name: thallium_Tl, nice_name: thallium (Tl), symbol: Tl
- weight: 204.38, weight_significant_figure: 2, weight_error_last_digit: 2
- Z_over_A: 0.39631, sternheimhersh_density: 11.72, corrected_density: 11.72,
- State::Solid, MediumType::Element, Ieff=810.0, Cbar=6.1365, X0=0.3491, x1=3.8044, aa=0.09455, sk=3.145, dlt0=0.14

class LeadPb

Media properties from properties8.dat file from NIST:

- Sternheimer index: 82, label: *Lead*, name: lead_Pb, nice_name: lead (Pb), symbol: Pb
- weight: 207.2, weight_significant_figure: 1, weight_error_last_digit: 1
- Z_over_A: 0.39575, sternheimhersh_density: 11.35, corrected_density: 11.35,
- State::Solid, MediumType::Element, Ieff=823.0, Cbar=6.2018, X0=0.3776, x1=3.8073, aa=0.09359, sk=3.1608, dlt0=0.14

class BismuthBi

Media properties from properties8.dat file from NIST:

- Sternheimer index: 83, label: Bismu, name: bismuth_Bi, nice_name: bismuth (Bi), symbol: Bi
- weight: 208.9804, weight_significant_figure: 5, weight_error_last_digit: 1
- Z_over_A: 0.39717, sternheimhersh_density: 9.747, corrected_density: 9.747,
- State::Solid, MediumType::Element, Ieff=823.0, Cbar=6.3505, X0=0.4152, x1=3.8248, aa=0.0941, sk=3.1671, dlt0=0.14

class PoloniumPo

Media properties from properties8.dat file from NIST:

- Sternheimer index: 84, label: Polon, name: polonium_Po, nice_name: polonium (Po), symbol: Po
- weight: 208.98243, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.40195, sternheimhersh_density: 9.32, corrected_density: 9.32,
- State::Solid, MediumType::RadioactiveElement, Ieff=830.0, Cbar=6.4003, X0=0.4267, x1=3.8293, aa=0.09282, sk=3.183, dlt0=0.14

class HydrogenLiquid

Media properties from properties8.dat file from NIST:

- Sternheimer index: 85, label: H-liq, name: hydrogen_liquid, nice_name: liquid hydrogen (H%2#), symbol: H
- weight: 1.008, weight_significant_figure: 3, weight_error_last_digit: 7
- Z_over_A: 0.99212, sternheimhersh_density: 0.06, corrected_density: 0.0708,
- State::Liquid, MediumType::Element, Ieff=21.8, Cbar=3.2632, X0=0.4759, x1=1.9215, aa=0.13483, sk=5.6249, dlt0=0.0

class RadonRn

Media properties from properties8.dat file from NIST:

- Sternheimer index: 86, label: *Radon*, name: radon_Rn, nice_name: radon (Rn), symbol: Rn
- weight: 222.01758, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.38736, sternheimhersh_density: 0.0090662, corrected_density: 0.0090662,
- State::Gas, MediumType::RadioactiveElement, Ieff=794.0, Cbar=13.2839, X0=1.5368, x1=4.9889, aa=0.20798, sk=2.7409, dlt0=0.0

class CarbonGraphiteC

Media properties from properties8.dat file from NIST:

- Sternheimer index: 87, label: C (gr, name: carbon_graphite_C, nice_name: carbon (graphite) (C), symbol: C
- weight: 12.0107, weight_significant_figure: 4, weight_error_last_digit: 8
- Z_over_A: 0.49955, sternheimhersh_density: 1.7, corrected_density: 2.21,
- State::Solid, MediumType::Element, Ieff=78.0, Cbar=3.155, X0=0.048, x1=2.5387, aa=0.20762, sk=2.9532, dlt0=0.14

class RadiumRa

Media properties from properties8.dat file from NIST:

- Sternheimer index: 88, label: Radium, name: radium_Ra, nice_name: radium (Ra), symbol: Ra
- weight: 226.02541, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.38934, sternheimhersh_density: 5.0, corrected_density: 5.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=826.0, Cbar=7.0452, X0=0.5991, x1=3.9428, aa=0.08804, sk=3.2454, dlt0=0.14

class ActiniumAc

Media properties from properties8.dat file from NIST:

- Sternheimer index: 89, label: Actin, name: actinium_Ac, nice_name: actinium (Ac), symbol: Ac
- weight: 227.02775, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.39202, sternheimhersh_density: 10.07, corrected_density: 10.07,
- State::Solid, MediumType::RadioactiveElement, Ieff=841.0, Cbar=6.3742, X0=0.4559, x1=3.7966, aa=0.08567, sk=3.2683, dlt0=0.14

class ThoriumTh

Media properties from properties8.dat file from NIST:

- Sternheimer index: 90, label: Thori, name: thorium_Th, nice_name: thorium (Th), symbol: Th
- weight: 232.0377, weight_significant_figure: 4, weight_error_last_digit: 4
- Z_over_A: 0.38787, sternheimhersh_density: 11.72, corrected_density: 11.72,
- State::Solid, MediumType::RadioactiveElement, Ieff=847.0, Cbar=6.2473, X0=0.4202, x1=3.7681, aa=0.08655, sk=3.261, dlt0=0.14

class ProtactiniumPa

Media properties from properties8.dat file from NIST:

- Sternheimer index: 91, label: Prota, name: protactinium_Pa, nice_name: protactinium (Pa), symbol: Pa
- weight: 231.03588, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.39388, sternheimhersh_density: 15.37, corrected_density: 15.37,
- State::Solid, MediumType::RadioactiveElement, Ieff=878.0, Cbar=6.0327, X0=0.3144, x1=3.5079, aa=0.1477, sk=2.9845, dlt0=0.14

class UraniumU

Media properties from properties8.dat file from NIST:

- Sternheimer index: 92, label: Urani, name: uranium_U, nice_name: uranium (U), symbol: U
- weight: 238.02891, weight_significant_figure: 5, weight_error_last_digit: 3
- Z_over_A: 0.38651, sternheimhersh_density: 18.95, corrected_density: 18.95,
- State::Solid, MediumType::RadioactiveElement, Ieff=890.0, Cbar=5.8694, X0=0.226, x1=3.3721, aa=0.19677, sk=2.8171, dlt0=0.14

class NeptuniumNp

Media properties from properties8.dat file from NIST:

- Sternheimer index: 93, label: Neptu, name: neptunium_Np, nice_name: neptunium (Np), symbol: Np
- weight: 237.04817, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.39233, sternheimhersh_density: 20.25, corrected_density: 20.25,
- State::Solid, MediumType::RadioactiveElement, Ieff=902.0, Cbar=5.8149, X0=0.1869, x1=3.369, aa=0.19741, sk=2.8082, dlt0=0.14

class PlutoniumPu

Media properties from properties8.dat file from NIST:

- Sternheimer index: 94, label: Pluto, name: plutonium_Pu, nice_name: plutonium (Pu), symbol: Pu
- weight: 244.0642, weight_significant_figure: 5, weight_error_last_digit: 4
- Z_over_A: 0.38514, sternheimhersh_density: 19.84, corrected_density: 19.84,

- State::Solid, MediumType::RadioactiveElement, Ieff=921.0, Cbar=5.8748, X0=0.1557, x1=3.3981, aa=0.20419, sk=2.7679, dlt0=0.14

class AmericiumAm

Media properties from properties8.dat file from NIST:

- Sternheimer index: 95, label: Ameri, name: americium_Am, nice_name: americium (Am), symbol: Am
- weight: 243.06138, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.39085, sternheimhersh_density: 13.67, corrected_density: 13.67,
- State::Solid, MediumType::RadioactiveElement, Ieff=934.0, Cbar=6.2813, X0=0.2274, x1=3.5021, aa=0.20308, sk=2.7615, dlt0=0.14

class CuriumCm

Media properties from properties8.dat file from NIST:

- Sternheimer index: 96, label: Curiu, name: curium_Cm, nice_name: curium (Cm), symbol: Cm
- weight: 247.07035, weight_significant_figure: 5, weight_error_last_digit: 3
- Z_over_A: 0.38855, sternheimhersh_density: 13.51, corrected_density: 13.51,
- State::Solid, MediumType::RadioactiveElement, Ieff=939.0, Cbar=6.3097, X0=0.2484, x1=3.516, aa=0.20257, sk=2.7579, dlt0=0.14

class BerkeliumBk

Media properties from properties8.dat file from NIST:

- Sternheimer index: 97, label: Berke, name: berkelium_Bk, nice_name: berkelium (Bk), symbol: Bk
- weight: 247.07031, weight_significant_figure: 5, weight_error_last_digit: 4
- Z_over_A: 0.3926, sternheimhersh_density: 0.986, corrected_density: 9.86,
- State::Solid, MediumType::RadioactiveElement, Ieff=952.0, Cbar=6.2912, X0=0.5509, x1=3.0, aa=0.25556, sk=3.0, dlt0=0.0

class CarbonCompactC

Media properties from properties8.dat file from NIST:

- Sternheimer index: 98, label: Carbo, name: carbon_compact_C, nice_name: carbon (compact) (C), symbol: C
- weight: 12.0107, weight_significant_figure: 4, weight_error_last_digit: 8
- Z_over_A: 0.49955, sternheimhersh_density: 2.265, corrected_density: 2.265,
- State::Solid, MediumType::RadioactiveElement, Ieff=78.0, Cbar=2.868, X0=-0.0178, x1=2.3415, aa=0.26142, sk=2.8697, dlt0=0.12

class A150TissueEquivalentPlastic

Media properties from properties8.dat file from NIST:

- Sternheimer index: 99, label: A-150, name: a-150_tissue-equivalent_plastic, nice_name: a-150 tissue-equivalent plastic, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54903, sternheimhersh_density: 1.127, corrected_density: 1.127,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=65.1, Cbar=3.11, X0=0.1329, x1=2.6234, aa=0.10783, sk=3.4442, dlt0=0.0

class Acetone

Media properties from properties8.dat file from NIST:

- Sternheimer index: 100, label: Aceto, name: acetone, nice_name: acetone (CH₃COCH₃), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55097, sternheimhersh_density: 0.7899, corrected_density: 0.7899,
- State::Liquid, MediumType::OrganicCompound, Ieff=64.2, Cbar=3.4341, X0=0.2197, x1=2.6928, aa=0.111, sk=3.4047, dlt0=0.0

class AcetyleneChch

Media properties from properties8.dat file from NIST:

- Sternheimer index: 101, label: Acety, name: acetylene_CHCH, nice_name: acetylene (CHCH), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53768, sternheimhersh_density: 0.0010967, corrected_density: 0.0010967,
- State::Gas, MediumType::OrganicCompound, Ieff=58.2, Cbar=9.8419, X0=1.6017, x1=4.0074, aa=0.12167, sk=3.4277, dlt0=0.0

class Adenine

Media properties from properties8.dat file from NIST:

- Sternheimer index: 102, label: Adeni, name: adenine, nice_name: adenine (C₅H₅N₅), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.51903, sternheimhersh_density: 1.35, corrected_density: 1.35,
- State::Solid, MediumType::OrganicCompound, Ieff=71.4, Cbar=3.1724, X0=0.1295, x1=2.4219, aa=0.20908, sk=3.0271, dlt0=0.0

class AdiposeTissueIcrp

Media properties from properties8.dat file from NIST:

- Sternheimer index: 103, label: Adip-, name: adipose_tissue_ICRP, nice_name: adipose tissue (ICRP), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55947, sternheimhersh_density: 0.92, corrected_density: 0.92,

- State::Solid, MediumType::BiologicalDosimetry, Ieff=63.2, Cbar=3.2367, X0=0.1827, x1=2.653, aa=0.10278, sk=3.4817, dlt0=0.0

class AirDry1Atm

Media properties from properties8.dat file from NIST:

- Sternheimer index: 104, label: Air, name: air_dry_1_atm, nice_name: air (dry, 1 atm), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49919, sternheimhersh_density: 0.0012048, corrected_density: 0.0012048,
- State::Gas, MediumType::Mixture, Ieff=85.7, Cbar=10.5961, X0=1.7418, x1=4.2759, aa=0.10914, sk=3.3994, dlt0=0.0

class Alanine

Media properties from properties8.dat file from NIST:

- Sternheimer index: 105, label: Alani, name: alanine, nice_name: alanine (C%3#H%7#NO%2#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53976, sternheimhersh_density: 1.42, corrected_density: 1.42,
- State::Solid, MediumType::OrganicCompound, Ieff=71.9, Cbar=3.0965, X0=0.1354, x1=2.6336, aa=0.11484, sk=3.3526, dlt0=0.0

class AluminumOxideSapphire

Media properties from properties8.dat file from NIST:

- Sternheimer index: 106, label: Al2O3, name: aluminum_oxide_sapphire, nice_name: aluminum oxide (sapphire, Al%2#O%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49038, sternheimhersh_density: 3.97, corrected_density: 3.97,
- State::Solid, MediumType::InorganicCompound, Ieff=145.2, Cbar=3.5682, X0=0.0402, x1=2.8665, aa=0.085, sk=3.5458, dlt0=0.0

class Amber

Media properties from properties8.dat file from NIST:

- Sternheimer index: 107, label: *Amber*, name: amber, nice_name: amber (C%10#H%16#O), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55179, sternheimhersh_density: 1.1, corrected_density: 1.1,
- State::Solid, MediumType::OrganicCompound, Ieff=63.2, Cbar=3.0701, X0=0.1335, x1=2.561, aa=0.11934, sk=3.4098, dlt0=0.0

class Ammonia

Media properties from properties8.dat file from NIST:

- Sternheimer index: 108, label: Ammon, name: ammonia, nice_name: ammonia (NH%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.59719, sternheimhersh_density: 0.00082602, corrected_density: 0.00082602,
- State::Gas, MediumType::InorganicCompound, Ieff=53.7, Cbar=9.8763, X0=1.6822, x1=4.1158, aa=0.08315, sk=3.6464, dlt0=0.0

class Aniline

Media properties from properties8.dat file from NIST:

- Sternheimer index: 109, label: Anili, name: aniline, nice_name: aniline (C%6#H%5#NH%2#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53699, sternheimhersh_density: 1.0235, corrected_density: 1.0235,
- State::Liquid, MediumType::OrganicCompound, Ieff=66.2, Cbar=3.2622, X0=0.1618, x1=2.5805, aa=0.13134, sk=3.3434, dlt0=0.0

class Anthracene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 110, label: Anthr, name: anthracene, nice_name: anthracene (C%14#H%10#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.5274, sternheimhersh_density: 1.283, corrected_density: 1.283,
- State::Solid, MediumType::OrganicCompound, Ieff=69.5, Cbar=3.1514, X0=0.1146, x1=2.5213, aa=0.14677, sk=3.2831, dlt0=0.0

class B100BoneEquivalentPlastic

Media properties from properties8.dat file from NIST:

- Sternheimer index: 111, label: B-100, name: b-100_Bone-equivalent_plastic, nice_name: b-100 Bone-equivalent plastic, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.5274, sternheimhersh_density: 1.45, corrected_density: 1.45,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=85.9, Cbar=3.4528, X0=0.1252, x1=3.042, aa=0.05268, sk=3.7365, dlt0=0.0

class Bakelite

Media properties from properties8.dat file from NIST:

- Sternheimer index: 112, label: Bakel, name: bakelite, nice_name: bakelite [(C%43#H%38#O%7#)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.52792, sternheimhersh_density: 1.25, corrected_density: 1.25,

- State::Solid, MediumType::Polymer, Ieff=72.4, Cbar=3.2582, X0=0.1471, x1=2.6055, aa=0.12713, sk=3.347, dlt0=0.0

class BariumFluoride

Media properties from properties8.dat file from NIST:

- Sternheimer index: 113, label: Ba-F2, name: barium_fluoride, nice_name: barium fluoride (BaF%2#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.42207, sternheimhersh_density: 4.89, corrected_density: 4.893,
- State::Solid, MediumType::InorganicCompound, Ieff=375.9, Cbar=5.4122, X0=-0.0098, x1=3.3871, aa=0.15991, sk=2.8867, dlt0=0.0

class BariumSulfate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 114, label: Ba-SO, name: barium_sulfate, nice_name: barium sulfate BaSO%4#, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.44561, sternheimhersh_density: 4.5, corrected_density: 4.5,
- State::Solid, MediumType::InorganicCompound, Ieff=285.7, Cbar=4.8923, X0=-0.0128, x1=3.4069, aa=0.11747, sk=3.0427, dlt0=0.0

class Benzene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 115, label: Benze, name: benzene, nice_name: benzene C%6#H%6#, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53769, sternheimhersh_density: 0.87865, corrected_density: 0.87865,
- State::Liquid, MediumType::OrganicCompound, Ieff=63.4, Cbar=3.3269, X0=0.171, x1=2.5091, aa=0.16519, sk=3.2174, dlt0=0.0

class BerylliumOxideBeo

Media properties from properties8.dat file from NIST:

- Sternheimer index: 116, label: Be-O, name: beryllium_oxide_BeO, nice_name: beryllium oxide (BeO), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.47979, sternheimhersh_density: 3.01, corrected_density: 3.01,
- State::Solid, MediumType::InorganicCompound, Ieff=93.2, Cbar=2.9801, X0=0.0241, x1=2.5846, aa=0.10755, sk=3.4927, dlt0=0.0

class BismuthGermanateBgo

Media properties from properties8.dat file from NIST:

- Sternheimer index: 117, label: BGO, name: bismuth_germanate_BGO, nice_name: bismuth germanate (BGO) [(Bi%2#O%3#)%2#(GeO%2#)%3#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.42065, sternheimhersh_density: 7.13, corrected_density: 7.13,
- State::Solid, MediumType::InorganicCompound, Ieff=534.1, Cbar=5.7409, X0=0.0456, x1=3.7816, aa=0.09569, sk=3.0781, dlt0=0.0

class BloodIcrp

Media properties from properties8.dat file from NIST:

- Sternheimer index: 118, label: Blood, name: blood_ICRP, nice_name: blood (ICRP), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54995, sternheimhersh_density: 1.06, corrected_density: 1.06,
- State::Liquid, MediumType::BiologicalDosimetry, Ieff=75.2, Cbar=3.4581, X0=0.2239, x1=2.8017, aa=0.08492, sk=3.5406, dlt0=0.0

class CompactBoneIcru

Media properties from properties8.dat file from NIST:

- Sternheimer index: 119, label: Bonec, name: compact_bone_ICRU, nice_name: compact bone (ICRU), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.5301, sternheimhersh_density: 1.85, corrected_density: 1.85,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=91.9, Cbar=3.339, X0=0.0944, x1=3.0201, aa=0.05822, sk=3.6419, dlt0=0.0

class CorticalBoneIcrp

Media properties from properties8.dat file from NIST:

- Sternheimer index: 120, label: Bonec, name: cortical_bone_ICRP, nice_name: cortical bone (ICRP), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.5213, sternheimhersh_density: 1.85, corrected_density: 1.85,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=106.4, Cbar=3.6488, X0=0.1161, x1=3.0919, aa=0.06198, sk=3.5919, dlt0=0.0

class BoronCarbide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 121, label: B4-C, name: boron_carbide, nice_name: boron carbide (B%4#C), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.47059, sternheimhersh_density: 2.52, corrected_density: 2.52,

- State::Solid, MediumType::InorganicCompound, Ieff=84.7, Cbar=2.9859, X0=0.0093, x1=2.1006, aa=0.37087, sk=2.8076, dlt0=0.0

class BoronOxide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 122, label: B2-O3, name: boron_oxide, nice_name: boron oxide (B%2#O%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49839, sternheimhers_density: 1.812, corrected_density: 1.812,
- State::Solid, MediumType::InorganicCompound, Ieff=99.6, Cbar=3.6027, X0=0.1843, x1=2.7379, aa=0.11548, sk=3.3832, dlt0=0.0

class BrainIcrp

Media properties from properties8.dat file from NIST:

- Sternheimer index: 123, label: Brain, name: brain_ICRP, nice_name: brain (ICRP), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55423, sternheimhers_density: 1.03, corrected_density: 1.03,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=73.3, Cbar=3.4279, X0=0.2206, x1=2.8021, aa=0.08255, sk=3.5585, dlt0=0.0

class Butane

Media properties from properties8.dat file from NIST:

- Sternheimer index: 124, label: Butan, name: butane, nice_name: butane (C%4#H%10#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.59497, sternheimhers_density: 0.0024934, corrected_density: 0.002489,
- State::Gas, MediumType::OrganicCompound, Ieff=48.3, Cbar=8.5633, X0=1.3788, x1=3.7524, aa=0.10852, sk=3.4884, dlt0=0.0

class NButylAlcohol

Media properties from properties8.dat file from NIST:

- Sternheimer index: 125, label: Butyl, name: n-butyl_alcohol, nice_name: n-butyl alcohol (C%4#H%9#OH), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.56663, sternheimhers_density: 0.8098, corrected_density: 0.8098,
- State::Liquid, MediumType::OrganicCompound, Ieff=59.9, Cbar=3.2425, X0=0.1937, x1=2.6439, aa=0.10081, sk=3.5139, dlt0=0.0

class C552AirEquivalentPlastic

Media properties from properties8.dat file from NIST:

- Sternheimer index: 126, label: C-552, name: C-552_air-equivalent_plastic, nice_name: C-552 air-equivalent plastic, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49969, sternheimhersh_density: 1.76, corrected_density: 1.76,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=86.8, Cbar=3.3338, X0=0.151, x1=2.7083, aa=0.10492, sk=3.4344, dlt0=0.0

class CadmiumTellurideCdTe

Media properties from properties8.dat file from NIST:

- Sternheimer index: 127, label: Cd-Te, name: cadmium_telluride_CdTe, nice_name: cadmium telluride (CdTe), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.41665, sternheimhersh_density: 6.2, corrected_density: 6.2,
- State::Solid, MediumType::InorganicCompound, Ieff=539.3, Cbar=5.9096, X0=0.0438, x1=3.2836, aa=0.2484, sk=2.6665, dlt0=0.0

class CadmiumTungstate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 128, label: Cd-W-, name: cadmium_tungstate, nice_name: cadmium tungstate (CdWO₄), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.42747, sternheimhersh_density: 7.9, corrected_density: 7.9,
- State::Solid, MediumType::InorganicCompound, Ieff=468.3, Cbar=5.3594, X0=0.0123, x1=3.5941, aa=0.12861, sk=2.915, dlt0=0.0

class CalciumCarbonate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 129, label: Ca-C-, name: calcium_carbonate, nice_name: calcium carbonate (CaCO₃), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49955, sternheimhersh_density: 2.8, corrected_density: 2.8,
- State::Solid, MediumType::InorganicCompound, Ieff=136.4, Cbar=3.7738, X0=0.0492, x1=3.0549, aa=0.08301, sk=3.412, dlt0=0.0

class CalciumFluoride

Media properties from properties8.dat file from NIST:

- Sternheimer index: 130, label: Ca-F₂, name: calcium_fluoride, nice_name: calcium fluoride (CaF₂), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.4967, sternheimhersh_density: 3.18, corrected_density: 3.18,

- State::Solid, MediumType::InorganicCompound, Ieff=166.0, Cbar=4.0653, X0=0.0676, x1=3.1683, aa=0.06942, sk=3.5263, dlt0=0.0

class CalciumOxideCao

Media properties from properties8.dat file from NIST:

- Sternheimer index: 131, label: Ca-O, name: calcium_oxide_CaO, nice_name: calcium oxide (CaO), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49929, sternheimhersh_density: 3.3, corrected_density: 3.3,
- State::Solid, MediumType::InorganicCompound, Ieff=176.1, Cbar=4.1209, X0=-0.0172, x1=3.0171, aa=0.12128, sk=3.1936, dlt0=0.0

class CalciumSulfate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 132, label: Ca-S-, name: calcium_sulfate, nice_name: calcium sulfate (CaSO₄), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.4995, sternheimhersh_density: 2.96, corrected_density: 2.96,
- State::Solid, MediumType::InorganicCompound, Ieff=152.3, Cbar=3.9388, X0=0.0587, x1=3.1229, aa=0.07708, sk=3.4495, dlt0=0.0

class CalciumTungstate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 133, label: Ca-W-, name: calcium_tungstate, nice_name: calcium tungstate (CaWO₄), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.43761, sternheimhersh_density: 6.062, corrected_density: 6.062,
- State::Solid, MediumType::InorganicCompound, Ieff=395.0, Cbar=5.2603, X0=0.0323, x1=3.8932, aa=0.0621, sk=3.2649, dlt0=0.0

class CarbonDioxideGas

Media properties from properties8.dat file from NIST:

- Sternheimer index: 134, label: C-O2, name: carbon_dioxide_gas, nice_name: carbon dioxide gas (CO₂), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49989, sternheimhersh_density: 0.0018421, corrected_density: 0.0018421,
- State::Gas, MediumType::InorganicCompound, Ieff=85.0, Cbar=10.1537, X0=1.6294, x1=4.1825, aa=0.11768, sk=3.3227, dlt0=0.0

class CarbonTetrachloride

Media properties from properties8.dat file from NIST:

- Sternheimer index: 135, label: C-Cl4, name: carbon_tetrachloride, nice_name: carbon tetrachloride (CCl%4#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49107, sternheimhersh_density: 1.594, corrected_density: 1.594,
- State::Liquid, MediumType::OrganicCompound, Ieff=166.3, Cbar=4.7712, X0=0.1773, x1=2.9165, aa=0.19018, sk=3.0116, dlt0=0.0

class Cellulose

Media properties from properties8.dat file from NIST:

- Sternheimer index: 136, label: Cello, name: cellulose, nice_name: cellulose [(C%6#H%10#O%5#)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.5304, sternheimhersh_density: 1.42, corrected_density: 1.42,
- State::Solid, MediumType::Polymer, Ieff=77.6, Cbar=3.2647, X0=0.158, x1=2.6778, aa=0.11151, sk=3.381, dlt0=0.0

class CelluloseAcetateButyrate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 137, label: Cella, name: cellulose_acetate_butyrate, nice_name: cellulose acetate butyrate [(C%15#H%22#O%8#)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53279, sternheimhersh_density: 1.2, corrected_density: 1.2,
- State::Solid, MediumType::Polymer, Ieff=74.6, Cbar=3.3497, X0=0.1794, x1=2.6809, aa=0.11444, sk=3.3738, dlt0=0.0

class CelluloseNitrate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 138, label: Celln, name: cellulose_nitrate, nice_name: cellulose nitrate [(C%12#H%14#O%4#(ONO%2#)%6#)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.51424, sternheimhersh_density: 1.49, corrected_density: 1.49,
- State::Solid, MediumType::Polymer, Ieff=87.0, Cbar=3.4762, X0=0.1897, x1=2.7253, aa=0.11813, sk=3.3237, dlt0=0.0

class CericSulfateDosimeterSolution

Media properties from properties8.dat file from NIST:

- Sternheimer index: 139, label: Cersu, name: ceric_sulfate_dosimeter_solution, nice_name: ceric sulfate dosimeter solution, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55279, sternheimhersh_density: 1.03, corrected_density: 1.03,

- State::Liquid, MediumType::BiologicalDosimetry, Ieff=76.7, Cbar=3.5212, X0=0.2363, x1=2.8769, aa=0.07666, sk=3.5607, dlt0=0.0

class CesiumFluorideCsf

Media properties from properties8.dat file from NIST:

- Sternheimer index: 140, label: Cs-F, name: cesium_fluoride_CsF, nice_name: cesium fluoride (CsF), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.42132, sternheimhersh_density: 4.115, corrected_density: 4.115,
- State::Solid, MediumType::InorganicCompound, Ieff=440.7, Cbar=5.9046, X0=0.0084, x1=3.3374, aa=0.22052, sk=2.728, dlt0=0.0

class CesiumIodideCsi

Media properties from properties8.dat file from NIST:

- Sternheimer index: 141, label: Cs-I, name: cesium_iodide_CsI, nice_name: cesium iodide (CsI), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.41569, sternheimhersh_density: 4.51, corrected_density: 4.51,
- State::Solid, MediumType::InorganicCompound, Ieff=553.1, Cbar=6.2807, X0=0.0395, x1=3.3353, aa=0.25381, sk=2.6657, dlt0=0.0

class Chlorobenzene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 142, label: Chlor, name: chlorobenzene, nice_name: chlorobenzene C%6#H%5#Cl, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.51529, sternheimhersh_density: 1.1058, corrected_density: 1.1058,
- State::Liquid, MediumType::OrganicCompound, Ieff=89.1, Cbar=3.8201, X0=0.1714, x1=2.9272, aa=0.09856, sk=3.3797, dlt0=0.0

class Chloroform

Media properties from properties8.dat file from NIST:

- Sternheimer index: 143, label: Chlor, name: chloroform, nice_name: chloroform (CHCl%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.48585, sternheimhersh_density: 1.4832, corrected_density: 1.4832,
- State::Liquid, MediumType::OrganicCompound, Ieff=156.0, Cbar=4.7055, X0=0.1786, x1=2.9581, aa=0.16959, sk=3.0627, dlt0=0.0

class ShieldingConcrete

Media properties from properties8.dat file from NIST:

- Sternheimer index: 144, label: Concr, name: shielding_concrete, nice_name: shielding concrete, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.50274, sternheimhersh_density: 2.3, corrected_density: 2.3,
- State::Solid, MediumType::Mixture, Ieff=135.2, Cbar=3.9464, X0=0.1301, x1=3.0466, aa=0.07515, sk=3.5467, dlt0=0.0

class Cyclohexane

Media properties from properties8.dat file from NIST:

- Sternheimer index: 145, label: Cyclo, name: cyclohexane, nice_name: cyclohexane (C%6#H%12#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.57034, sternheimhersh_density: 0.779, corrected_density: 0.779,
- State::Liquid, MediumType::OrganicCompound, Ieff=56.4, Cbar=3.1544, X0=0.1728, x1=2.5549, aa=0.12035, sk=3.4278, dlt0=0.0

class _12Dichlorobenzene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 146, label: Dichl, name: 12-dichlorobenzene, nice_name: 1,2-dichlorobenzene (C%6#H%4#Cl%2#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.50339, sternheimhersh_density: 1.3048, corrected_density: 1.3048,
- State::Liquid, MediumType::OrganicCompound, Ieff=106.5, Cbar=4.0348, X0=0.1587, x1=2.8276, aa=0.1601, sk=3.0836, dlt0=0.0

class DichlorodiethylEther

Media properties from properties8.dat file from NIST:

- Sternheimer index: 147, label: Dichl, name: dichlorodiethyl_ether, nice_name: dichlorodiethyl ether C%4#Cl%2#H%8#O, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.51744, sternheimhersh_density: 1.2199, corrected_density: 1.2199,
- State::Liquid, MediumType::OrganicCompound, Ieff=103.3, Cbar=4.0135, X0=0.1773, x1=3.1586, aa=0.06799, sk=3.525, dlt0=0.0

class _12Dichloroethane

Media properties from properties8.dat file from NIST:

- Sternheimer index: 148, label: Dichl, name: 12-dichloroethane, nice_name: 1,2-dichloroethane C%2#H%4#C%12#, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.50526, sternheimhersh_density: 1.2351, corrected_density: 1.2351,

- State::Liquid, MediumType::OrganicCompound, Ieff=111.9, Cbar=4.1849, X0=0.1375, x1=2.9529, aa=0.13383, sk=3.1675, dlt0=0.0

class DiethylEther

Media properties from properties8.dat file from NIST:

- Sternheimer index: 149, label: Dieth, name: diethyl_ether, nice_name: diethyl ether [(CH%3#CH%2#)%2#O], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.56663, sternheimhersh_density: 0.71378, corrected_density: 0.71378,
- State::Liquid, MediumType::OrganicCompound, Ieff=60.0, Cbar=3.3721, X0=0.2231, x1=2.6745, aa=0.1055, sk=3.4586, dlt0=0.0

class MnDimethylFormamide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 150, label: Dimet, name: mn-dimethyl_formamide, nice_name: m,n-dimethyl formamide (C%3#H%6#NOH), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54724, sternheimhersh_density: 0.9487, corrected_density: 0.9487,
- State::Solid, MediumType::OrganicCompound, Ieff=66.6, Cbar=3.3311, X0=0.1977, x1=2.6686, aa=0.1147, sk=3.371, dlt0=0.0

class DimethylSulfoxide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 151, label: Dimet, name: dimethyl_sulfoxide, nice_name: dimethyl sulfoxide (CH%3#)%2#SO, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53757, sternheimhersh_density: 1.1014, corrected_density: 1.1014,
- State::Solid, MediumType::OrganicCompound, Ieff=98.6, Cbar=3.9844, X0=0.2021, x1=3.1263, aa=0.06619, sk=3.5708, dlt0=0.0

class Ethane

Media properties from properties8.dat file from NIST:

- Sternheimer index: 152, label: Ethan, name: ethane, nice_name: ethane (C%2#H%6#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.59861, sternheimhersh_density: 0.0012532, corrected_density: 0.001263,
- State::Gas, MediumType::OrganicCompound, Ieff=45.4, Cbar=9.1043, X0=1.5107, x1=3.8743, aa=0.09627, sk=3.6095, dlt0=0.0

class Ethanol

Media properties from properties8.dat file from NIST:

- Sternheimer index: 153, label: Ethan, name: ethanol, nice_name: ethanol (C%2#H%5#OH), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.56437, sternheimhersh_density: 0.7893, corrected_density: 0.7893,
- State::Liquid, MediumType::OrganicCompound, Ieff=62.9, Cbar=3.3699, X0=0.2218, x1=2.7052, aa=0.09878, sk=3.4834, dlt0=0.0

class EthylCellulose

Media properties from properties8.dat file from NIST:

- Sternheimer index: 154, label: Ethyl, name: ethyl_cellulose, nice_name: ethyl cellulose ([C%12#H%22#O5)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54405, sternheimhersh_density: 1.13, corrected_density: 1.13,
- State::Solid, MediumType::Polymer, Ieff=69.3, Cbar=3.2415, X0=0.1683, x1=2.6527, aa=0.11077, sk=3.4098, dlt0=0.0

class Ethylene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 155, label: Ethyl, name: ethylene, nice_name: ethylene (C%2#H%4#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.57034, sternheimhersh_density: 0.001175, corrected_density: 0.001175,
- State::Gas, MediumType::OrganicCompound, Ieff=50.7, Cbar=9.438, X0=1.5528, x1=3.9327, aa=0.10636, sk=3.5387, dlt0=0.0

class EyeLensIcrp

Media properties from properties8.dat file from NIST:

- Sternheimer index: 156, label: Eye-l, name: eye_lens_ICRP, nice_name: eye lens (ICRP), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54977, sternheimhersh_density: 1.1, corrected_density: 1.1,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=73.3, Cbar=3.372, X0=0.207, x1=2.7446, aa=0.0969, sk=3.455, dlt0=0.0

class FerricOxide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 157, label: Fe2-O, name: ferric_oxide, nice_name: ferric oxide (Fe%2#O%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.47592, sternheimhersh_density: 5.2, corrected_density: 5.2,

- State::Solid, MediumType::InorganicCompound, Ieff=227.3, Cbar=4.2245, X0=-0.0074, x1=3.2573, aa=0.10478, sk=3.1313, dlt0=0.0

class FerroborideFeb

Media properties from properties8.dat file from NIST:

- Sternheimer index: 158, label: Fe-B, name: ferroboride_FeB, nice_name: ferroboride (FeB), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.46507, sternheimhersh_density: 7.15, corrected_density: 7.15,
- State::Solid, MediumType::InorganicCompound, Ieff=261.0, Cbar=4.2057, X0=-0.0988, x1=3.1749, aa=0.12911, sk=3.024, dlt0=0.0

class FerrousOxideFeo

Media properties from properties8.dat file from NIST:

- Sternheimer index: 159, label: Fe-O, name: ferrous_oxide_FeO, nice_name: ferrous oxide (FeO), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.47323, sternheimhersh_density: 5.7, corrected_density: 5.7,
- State::Solid, MediumType::InorganicCompound, Ieff=248.6, Cbar=4.3175, X0=-0.0279, x1=3.2002, aa=0.12959, sk=3.0168, dlt0=0.0

class FerrousSulfateDosimeterSolution

Media properties from properties8.dat file from NIST:

- Sternheimer index: 160, label: Fe-su, name: ferrous_sulfate_dosimeter_solution, nice_name: ferrous sulfate dosimeter solution, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55329, sternheimhersh_density: 1.024, corrected_density: 1.024,
- State::Liquid, MediumType::BiologicalDosimetry, Ieff=76.4, Cbar=3.5183, X0=0.2378, x1=2.8254, aa=0.08759, sk=3.4923, dlt0=0.0

class Freon12

Media properties from properties8.dat file from NIST:

- Sternheimer index: 161, label: Freon, name: Freon-12, nice_name: Freon-12 (CF%2#Cl%2#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.47969, sternheimhersh_density: 1.12, corrected_density: 1.12,
- State::Gas, MediumType::OrganicCompound, Ieff=143.0, Cbar=4.8251, X0=0.3035, x1=3.2659, aa=0.07978, sk=3.4626, dlt0=0.0

class Freon12b2

Media properties from properties8.dat file from NIST:

- Sternheimer index: 162, label: Freon, name: Freon-12B2, nice_name: Freon-12B2 (CF%2#Br%2#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.44901, sternheimhersh_density: 1.8, corrected_density: 1.8,
- State::Gas, MediumType::OrganicCompound, Ieff=284.9, Cbar=5.7976, X0=0.3406, x1=3.7956, aa=0.05144, sk=3.5565, dlt0=0.0

class Freon13

Media properties from properties8.dat file from NIST:

- Sternheimer index: 163, label: Freon, name: Freon-13, nice_name: Freon-13 (CF%3#Cl), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.47966, sternheimhersh_density: 0.95, corrected_density: 0.95,
- State::Gas, MediumType::OrganicCompound, Ieff=126.6, Cbar=4.7483, X0=0.3659, x1=3.2337, aa=0.07238, sk=3.5551, dlt0=0.0

class Freon13b1

Media properties from properties8.dat file from NIST:

- Sternheimer index: 164, label: Freon, name: Freon-13b1, nice_name: Freon-13b1 (CF%3#Br), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.45665, sternheimhersh_density: 1.5, corrected_density: 1.5,
- State::Gas, MediumType::OrganicCompound, Ieff=210.5, Cbar=5.3555, X0=0.3522, x1=3.7554, aa=0.03925, sk=3.7194, dlt0=0.0

class Freon13i1

Media properties from properties8.dat file from NIST:

- Sternheimer index: 165, label: Freon, name: Freon-13i1, nice_name: Freon-13i1 (CF%3#I), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.43997, sternheimhersh_density: 1.8, corrected_density: 1.8,
- State::Gas, MediumType::OrganicCompound, Ieff=293.5, Cbar=5.8774, X0=0.2847, x1=3.728, aa=0.09112, sk=3.1658, dlt0=0.0

class GadoliniumOxysulfide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 166, label: Gd2-O, name: gadolinium_oxysulfide, nice_name: gadolinium oxysulfide (Gd%2#O%2#S), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.42266, sternheimhersh_density: 7.44, corrected_density: 7.44,

- State::Solid, MediumType::InorganicCompound, Ieff=493.3, Cbar=5.5347, X0=-0.1774, x1=3.4045, aa=0.22161, sk=2.63, dlt0=0.0

class GalliumArsenideGaas

Media properties from properties8.dat file from NIST:

- Sternheimer index: 167, label: Ga-As, name: gallium_arsenide_GaAs, nice_name: gallium arsenide (GaAs), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.44247, sternheimers_density: 5.31, corrected_density: 5.31,
- State::Solid, MediumType::InorganicCompound, Ieff=384.9, Cbar=5.3299, X0=0.1764, x1=3.642, aa=0.07152, sk=3.3356, dlt0=0.0

class GelInPhotographicEmulsion

Media properties from properties8.dat file from NIST:

- Sternheimer index: 168, label: Photo, name: gel_in_photographic_emulsion, nice_name: gel in photographic emulsion, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53973, sternheimers_density: 1.2914, corrected_density: 1.2914,
- State::Solid, MediumType::Mixture, Ieff=74.8, Cbar=3.2687, X0=0.1709, x1=2.7058, aa=0.10102, sk=3.4418, dlt0=0.0

class BorosilicateGlassPyrexCorning7740

Media properties from properties8.dat file from NIST:

- Sternheimer index: 169, label: Pyrex, name: borosilicate_glass_Pyrex_Corning_7740, nice_name: borosilicate glass (Pyrex Corning 7740), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49707, sternheimers_density: 2.23, corrected_density: 2.23,
- State::Solid, MediumType::Mixture, Ieff=134.0, Cbar=3.9708, X0=0.1479, x1=2.9933, aa=0.0827, sk=3.5224, dlt0=0.0

class LeadGlass

Media properties from properties8.dat file from NIST:

- Sternheimer index: 170, label: *Lead*, name: lead_glass, nice_name: lead glass, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.42101, sternheimers_density: 6.22, corrected_density: 6.22,
- State::Solid, MediumType::Mixture, Ieff=526.4, Cbar=5.8476, X0=0.0614, x1=3.8146, aa=0.09544, sk=3.074, dlt0=0.0

class PlateGlass

Media properties from properties8.dat file from NIST:

- Sternheimer index: 171, label: Glass, name: plate_glass, nice_name: plate glass, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49731, sternheimhersh_density: 2.4, corrected_density: 2.4,
- State::Solid, MediumType::Mixture, Ieff=145.4, Cbar=4.0602, X0=0.1237, x1=3.0649, aa=0.07678, sk=3.5381, dlt0=0.0

class GlucoseDextroseMonohydrate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 172, label: Gluco, name: glucose_dextrose_monohydrate, nice_name: glucose (dextrose monohydrate) (C6H12O6.H2O), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53499, sternheimhersh_density: 1.54, corrected_density: 1.54,
- State::Solid, MediumType::OrganicCompound, Ieff=77.2, Cbar=3.1649, X0=0.1411, x1=2.67, aa=0.10783, sk=3.3946, dlt0=0.0

class Glutamine

Media properties from properties8.dat file from NIST:

- Sternheimer index: 173, label: Gluta, name: glutamine, nice_name: glutamine (C5H10N2O3), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53371, sternheimhersh_density: 1.46, corrected_density: 1.46,
- State::Solid, MediumType::OrganicCompound, Ieff=73.3, Cbar=3.1167, X0=0.1347, x1=2.6301, aa=0.11931, sk=3.3254, dlt0=0.0

class Glycerol

Media properties from properties8.dat file from NIST:

- Sternheimer index: 174, label: Glyce, name: glycerol, nice_name: glycerol (C3H5(OH)3), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54292, sternheimhersh_density: 1.2613, corrected_density: 1.2613,
- State::Liquid, MediumType::OrganicCompound, Ieff=72.6, Cbar=3.2267, X0=0.1653, x1=2.6862, aa=0.10168, sk=3.4481, dlt0=0.0

class Guanine

Media properties from properties8.dat file from NIST:

- Sternheimer index: 175, label: Guani, name: guanine, nice_name: guanine (C5H5N5O), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.51612, sternheimhersh_density: 1.58, corrected_density: 1.58,

- State::Solid, MediumType::OrganicCompound, Ieff=75.0, Cbar=3.1171, X0=0.1163, x1=2.4296, aa=0.2053, sk=3.0186, dlt0=0.0

class GypsumPlasterOfParis

Media properties from properties8.dat file from NIST:

- Sternheimer index: 176, label: Gypsu, name: gypsum_plaster_of_Paris, nice_name: gypsum (plaster of Paris, $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.51113, sternheimhersh_density: 2.32, corrected_density: 2.32,
- State::Solid, MediumType::InorganicCompound, Ieff=129.7, Cbar=3.8382, X0=0.0995, x1=3.1206, aa=0.06949, sk=3.5134, dlt0=0.0

class NHeptane

Media properties from properties8.dat file from NIST:

- Sternheimer index: 177, label: Hepta, name: n-heptane, nice_name: n-heptane (C_7H_{16}), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.57992, sternheimhersh_density: 0.68376, corrected_density: 0.68376,
- State::Liquid, MediumType::OrganicCompound, Ieff=54.4, Cbar=3.1978, X0=0.1928, x1=2.5706, aa=0.11255, sk=3.4885, dlt0=0.0

class NHexane

Media properties from properties8.dat file from NIST:

- Sternheimer index: 178, label: Hexan, name: n-hexane, nice_name: n-hexane C_6H_{14} , symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.5902, sternheimhersh_density: 0.6603, corrected_density: 0.6603,
- State::Liquid, MediumType::OrganicCompound, Ieff=54.0, Cbar=3.2156, X0=0.1984, x1=2.5757, aa=0.11085, sk=3.5027, dlt0=0.0

class PolyimideFilm

Media properties from properties8.dat file from NIST:

- Sternheimer index: 179, label: Kapto, name: polyimide_film, nice_name: polyimide film $[(\text{C}_{22}\text{H}_{10}\text{N}_2\text{O}_5)_n]$, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.51264, sternheimhersh_density: 1.42, corrected_density: 1.42,
- State::Solid, MediumType::Polymer, Ieff=79.6, Cbar=3.3497, X0=0.1509, x1=2.5631, aa=0.15972, sk=3.1921, dlt0=0.0

class LanthanumOxybromideLaobr

Media properties from properties8.dat file from NIST:

- Sternheimer index: 180, label: La-O-, name: lanthanum_oxybromide_LaOBr, nice_name: lanthanum oxybromide (LaOBr), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.42599, sternheimhersh_density: 6.28, corrected_density: 6.28,
- State::Solid, MediumType::InorganicCompound, Ieff=439.7, Cbar=5.4666, X0=-0.035, x1=3.3288, aa=0.1783, sk=2.8457, dlt0=0.0

class LanthanumOxysulfide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 181, label: La2-O, name: lanthanum_oxysulfide, nice_name: lanthanum oxysulfide La₂O%2#S, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.42706, sternheimhersh_density: 5.86, corrected_density: 5.86,
- State::Solid, MediumType::InorganicCompound, Ieff=421.2, Cbar=5.447, X0=-0.0906, x1=3.2664, aa=0.21501, sk=2.7298, dlt0=0.0

class LeadOxidePbo

Media properties from properties8.dat file from NIST:

- Sternheimer index: 182, label: Pb-O, name: lead_oxide_PbO, nice_name: lead oxide (PbO), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.40323, sternheimhersh_density: 9.53, corrected_density: 9.53,
- State::Solid, MediumType::InorganicCompound, Ieff=766.7, Cbar=6.2162, X0=0.0356, x1=3.5456, aa=0.19645, sk=2.7299, dlt0=0.0

class LithiumAmide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 183, label: Li-N-, name: lithium_amide, nice_name: lithium amide (LiNH₂), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.52257, sternheimhersh_density: 1.178, corrected_density: 1.178,
- State::Solid, MediumType::InorganicCompound, Ieff=55.5, Cbar=2.7961, X0=0.0198, x1=2.5152, aa=0.0874, sk=3.7534, dlt0=0.0

class LithiumCarbonate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 184, label: LI2-C, name: lithium_carbonate, nice_name: lithium carbonate (Li₂C-O%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.4972, sternheimhersh_density: 2.11, corrected_density: 2.11,

- State::Solid, MediumType::InorganicCompound, Ieff=87.9, Cbar=3.2029, X0=0.0551, x1=2.6598, aa=0.09936, sk=3.5417, dlt0=0.0

class LithiumFluorideLif

Media properties from properties8.dat file from NIST:

- Sternheimer index: 185, label: Li-F, name: lithium_fluoride_LiF, nice_name: lithium fluoride (LiF), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.46262, sternheimhersh_density: 2.635, corrected_density: 2.635,
- State::Solid, MediumType::InorganicCompound, Ieff=94.0, Cbar=3.1667, X0=0.0171, x1=2.7049, aa=0.07593, sk=3.7478, dlt0=0.0

class LithiumHydrideLih

Media properties from properties8.dat file from NIST:

- Sternheimer index: 186, label: Li-H, name: lithium_hydride_LiH, nice_name: lithium hydride (LiH), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.50321, sternheimhersh_density: 0.82, corrected_density: 0.82,
- State::Solid, MediumType::InorganicCompound, Ieff=36.5, Cbar=2.358, X0=-0.0988, x1=1.4515, aa=0.90567, sk=2.5849, dlt0=0.0

class LithiumIodideLii

Media properties from properties8.dat file from NIST:

- Sternheimer index: 187, label: Li-I, name: lithium_iodide_LiI, nice_name: lithium iodide (LiI), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.41939, sternheimhersh_density: 3.494, corrected_density: 3.494,
- State::Solid, MediumType::InorganicCompound, Ieff=485.1, Cbar=6.2671, X0=0.0892, x1=3.3702, aa=0.23274, sk=2.7146, dlt0=0.0

class LithiumOxide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 188, label: Li2-O, name: lithium_oxide, nice_name: lithium oxide Li%2#O, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.46952, sternheimhersh_density: 2.013, corrected_density: 2.013,
- State::Solid, MediumType::InorganicCompound, Ieff=73.6, Cbar=2.934, X0=-0.0511, x1=2.5874, aa=0.08035, sk=3.7878, dlt0=0.0

class LithiumTetraborate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 189, label: Li2-B, name: lithium_tetraborate, nice_name: lithium tetraborate Li%2#B%4#O%7#, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.48487, sternheimhersh_density: 2.44, corrected_density: 2.44,
- State::Solid, MediumType::InorganicCompound, Ieff=94.6, Cbar=3.2093, X0=0.0737, x1=2.6502, aa=0.11075, sk=3.4389, dlt0=0.0

class LungIcrp

Media properties from properties8.dat file from NIST:

- Sternheimer index: 190, label: Lung, name: lung_ICRP, nice_name: lung (ICRP), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54965, sternheimhersh_density: 1.05, corrected_density: 1.05,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=75.3, Cbar=3.4708, X0=0.2261, x1=2.8001, aa=0.08588, sk=3.5353, dlt0=0.0

class M3Wax

Media properties from properties8.dat file from NIST:

- Sternheimer index: 191, label: M3-wa, name: M3_WAX, nice_name: M3 WAX, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55512, sternheimhersh_density: 1.05, corrected_density: 1.05,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=67.9, Cbar=3.254, X0=0.1523, x1=2.7529, aa=0.07864, sk=3.6412, dlt0=0.0

class MagnesiumCarbonate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 192, label: Mg-C-, name: magnesium_carbonate, nice_name: magnesium carbonate MgCO%3#, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49814, sternheimhersh_density: 2.958, corrected_density: 2.958,
- State::Solid, MediumType::InorganicCompound, Ieff=118.0, Cbar=3.4319, X0=0.086, x1=2.7997, aa=0.09219, sk=3.5003, dlt0=0.0

class MagnesiumFluoride

Media properties from properties8.dat file from NIST:

- Sternheimer index: 193, label: Mg-F2, name: magnesium_fluoride, nice_name: magnesium fluoride MgF%2#, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.48153, sternheimhersh_density: 3.0, corrected_density: 3.0,
- State::Solid, MediumType::InorganicCompound, Ieff=134.3, Cbar=3.7105, X0=0.1369, x1=2.863, aa=0.07934, sk=3.6485, dlt0=0.0

class MagnesiumOxideMgo

Media properties from properties8.dat file from NIST:

- Sternheimer index: 194, label: Mg-O, name: magnesium_oxide_MgO, nice_name: magnesium oxide MgO, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49622, sternheimhersh_density: 3.58, corrected_density: 3.58,
- State::Solid, MediumType::InorganicCompound, Ieff=143.8, Cbar=3.6404, X0=0.0575, x1=2.858, aa=0.08313, sk=3.5968, dlt0=0.0

class MagnesiumTetraborate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 195, label: Mg-B4, name: magnesium_tetraborate, nice_name: magnesium tetraborate MgB₄O₇, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49014, sternheimhersh_density: 2.53, corrected_density: 2.53,
- State::Solid, MediumType::InorganicCompound, Ieff=108.3, Cbar=3.4328, X0=0.1147, x1=2.7635, aa=0.09703, sk=3.4893, dlt0=0.0

class MercuricIodide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 196, label: Hg-I2, name: mercuric_iodide, nice_name: mercuric iodide HgI₂, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.40933, sternheimhersh_density: 6.36, corrected_density: 6.36,
- State::Solid, MediumType::InorganicCompound, Ieff=684.5, Cbar=6.3787, X0=0.104, x1=3.4728, aa=0.21513, sk=2.7264, dlt0=0.0

class Methane

Media properties from properties8.dat file from NIST:

- Sternheimer index: 197, label: Metha, name: methane, nice_name: methane (CH₄), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.62334, sternheimhersh_density: 0.00066715, corrected_density: 0.00066715,
- State::Gas, MediumType::OrganicCompound, Ieff=41.7, Cbar=9.5243, X0=1.6263, x1=3.9716, aa=0.09253, sk=3.6257, dlt0=0.0

class Methanol

Media properties from properties8.dat file from NIST:

- Sternheimer index: 198, label: Metha, name: methanol, nice_name: methanol (CH₃OH), symbol: *Unknown*

- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.56176, sternheimhersh_density: 0.7914, corrected_density: 0.7914,
- State::Liquid, MediumType::OrganicCompound, Ieff=67.6, Cbar=3.516, X0=0.2529, x1=2.7639, aa=0.0897, sk=3.5477, dlt0=0.0

class MixDWax

Media properties from properties8.dat file from NIST:

- Sternheimer index: 199, label: mix-D, name: mix_D_wax, nice_name: mix D wax, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.56479, sternheimhersh_density: 0.99, corrected_density: 0.99,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=60.9, Cbar=3.078, X0=0.1371, x1=2.7145, aa=0.0749, sk=3.6823, dlt0=0.0

class Ms20TissueSubstitute

Media properties from properties8.dat file from NIST:

- Sternheimer index: 200, label: MS20, name: ms20_tissue_substitute, nice_name: ms20 tissue substitute, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53886, sternheimhersh_density: 1.0, corrected_density: 1.0,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=75.1, Cbar=3.5341, X0=0.1997, x1=2.8033, aa=0.08294, sk=3.6061, dlt0=0.0

class SkeletalMuscleIcrp

Media properties from properties8.dat file from NIST:

- Sternheimer index: 201, label: Skelm, name: skeletal_muscle_ICRP, nice_name: skeletal muscle (ICRP), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54938, sternheimhersh_density: 1.04, corrected_density: 1.04,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=75.3, Cbar=3.4809, X0=0.2282, x1=2.7999, aa=0.08636, sk=3.533, dlt0=0.0

class StriatedMuscleIcru

Media properties from properties8.dat file from NIST:

- Sternheimer index: 202, label: Strim, name: striated_muscle_ICRU, nice_name: striated muscle (ICRU), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55005, sternheimhersh_density: 1.04, corrected_density: 1.04,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=74.7, Cbar=3.4636, X0=0.2249, x1=2.8032, aa=0.08507, sk=3.5383, dlt0=0.0

class MuscleEquivalentLiquidWithSucrose

Media properties from properties8.dat file from NIST:

- Sternheimer index: 203, label: Eqvmu, name: muscle-equivalent_liquid_with_sucrose, nice_name: muscle-equivalent liquid with sucrose, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54828, sternheimhersh_density: 1.11, corrected_density: 1.11,
- State::Liquid, MediumType::BiologicalDosimetry, Ieff=74.3, Cbar=3.391, X0=0.2098, x1=2.755, aa=0.09481, sk=3.4699, dlt0=0.0

class MuscleEquivalentLiquidWithoutSucrose

Media properties from properties8.dat file from NIST:

- Sternheimer index: 204, label: Eqvmu, name: muscle-equivalent_liquid_without_sucrose, nice_name: muscle-equivalent liquid without sucrose, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55014, sternheimhersh_density: 1.07, corrected_density: 1.07,
- State::Liquid, MediumType::BiologicalDosimetry, Ieff=74.2, Cbar=3.4216, X0=0.2187, x1=2.768, aa=0.09143, sk=3.4982, dlt0=0.0

class Naphtalene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 205, label: Napht, name: naphtalene, nice_name: naphtalene (C%10#H%8#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53053, sternheimhersh_density: 1.145, corrected_density: 1.145,
- State::Solid, MediumType::OrganicCompound, Ieff=68.4, Cbar=3.2274, X0=0.1374, x1=2.5429, aa=0.14766, sk=3.2654, dlt0=0.0

class Nitrobenzene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 206, label: Nitro, name: nitrobenzene, nice_name: nitrobenzene (C%6#H%5#NO%2#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.51986, sternheimhersh_density: 1.1987, corrected_density: 1.1987,
- State::Liquid, MediumType::OrganicCompound, Ieff=75.8, Cbar=3.4073, X0=0.1777, x1=2.663, aa=0.12727, sk=3.3091, dlt0=0.0

class NitrousOxide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 207, label: N2-O, name: nitrous_oxide, nice_name: nitrous oxide (N%2#O), symbol: *Unknown*

- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49985, sternheimhersh_density: 0.0018309, corrected_density: 0.0018309,
- State::Gas, MediumType::InorganicCompound, Ieff=84.9, Cbar=10.1575, X0=1.6477, x1=4.1565, aa=0.11992, sk=3.3318, dlt0=0.0

class NylonDuPontElvamide8062m

Media properties from properties8.dat file from NIST:

- Sternheimer index: 208, label: Elvam, name: Nylon_du_Pont_Elvamide_8062M, nice_name: Nylon du Pont Elvamide 8062M, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55063, sternheimhersh_density: 1.08, corrected_density: 1.08,
- State::Solid, MediumType::Polymer, Ieff=64.3, Cbar=3.125, X0=0.1503, x1=2.6004, aa=0.11513, sk=3.4044, dlt0=0.0

class NylonType666

Media properties from properties8.dat file from NIST:

- Sternheimer index: 209, label: Nylon, name: Nylon_type_6_6-6, nice_name: Nylon (type 6, 6/6) [(CH(CH%2#)%5#NO)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.5479, sternheimhersh_density: 1.14, corrected_density: 1.18,
- State::Solid, MediumType::Polymer, Ieff=63.9, Cbar=3.0634, X0=0.1336, x1=2.5834, aa=0.11818, sk=3.3826, dlt0=0.0

class NylonType610

Media properties from properties8.dat file from NIST:

- Sternheimer index: 210, label: Nylon, name: Nylon_type_6-10, nice_name: Nylon type 6/10 [(CH(CH%2#)%7#NO)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55236, sternheimhersh_density: 1.14, corrected_density: 1.14,
- State::Solid, MediumType::Polymer, Ieff=63.2, Cbar=3.0333, X0=0.1304, x1=2.5681, aa=0.11852, sk=3.3912, dlt0=0.0

class NylonType11Rilsan

Media properties from properties8.dat file from NIST:

- Sternheimer index: 211, label: Rilsa, name: Nylon_type_11_Rilsan, nice_name: Nylon type 11 Rilsan ([C%11#H%21#ON)n#], [(CH(CH%2#)%10#NO)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55649, sternheimhersh_density: 1.425, corrected_density: 1.425,
- State::Solid, MediumType::Polymer, Ieff=61.6, Cbar=2.7514, X0=0.0678, x1=2.4281, aa=0.14868, sk=3.2576, dlt0=0.0

class Octane

Media properties from properties8.dat file from NIST:

- Sternheimer index: 212, label: Octan, name: octane, nice_name: octane (C%8#H%18#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.57778, sternheimhersh_density: 0.7026, corrected_density: 0.7026,
- State::Liquid, MediumType::OrganicCompound, Ieff=54.7, Cbar=3.1834, X0=0.1882, x1=2.5664, aa=0.11387, sk=3.4776, dlt0=0.0

class Paraffin

Media properties from properties8.dat file from NIST:

- Sternheimer index: 213, label: Paraf, name: paraffin, nice_name: paraffin (CH%3#(CH%2#)n\approx23::CH%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.57275, sternheimhersh_density: 0.93, corrected_density: 0.93,
- State::Solid, MediumType::OrganicCompound, Ieff=55.9, Cbar=2.9551, X0=0.1289, x1=2.5084, aa=0.12087, sk=3.4288, dlt0=0.0

class NPentane

Media properties from properties8.dat file from NIST:

- Sternheimer index: 214, label: Penta, name: n-pentane, nice_name: n-pentane (C%5#H%12#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.58212, sternheimhersh_density: 0.6262, corrected_density: 0.6262,
- State::Liquid, MediumType::OrganicCompound, Ieff=53.6, Cbar=3.2504, X0=0.2086, x1=2.5855, aa=0.10809, sk=3.5265, dlt0=0.0

class PhotographicEmulsion

Media properties from properties8.dat file from NIST:

- Sternheimer index: 215, label: Photo, name: photographic_emulsion, nice_name: photographic emulsion, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.45453, sternheimhersh_density: 3.815, corrected_density: 3.815,
- State::Solid, MediumType::Mixture, Ieff=331.0, Cbar=5.3319, X0=0.1009, x1=3.4866, aa=0.12399, sk=3.0094, dlt0=0.0

class Polyvinyltoluene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 216, label: Plast, name: polyvinyltoluene, nice_name: polyvinyltoluene [(2-CH%3#C%6#H%4#CHCH%2#)n#], symbol: *Unknown*

- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54141, sternheimhers_density: 1.032, corrected_density: 1.032,
- State::Solid, MediumType::Polymer, Ieff=64.7, Cbar=3.1997, X0=0.1464, x1=2.4855, aa=0.16101, sk=3.2393, dlt0=0.0

class PlutoniumDioxide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 217, label: Pu-O2, name: plutonium_dioxide, nice_name: plutonium dioxide (PuO%2#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.40583, sternheimhers_density: 11.46, corrected_density: 11.46,
- State::Solid, MediumType::InorganicCompound, Ieff=746.5, Cbar=5.9719, X0=-0.2311, x1=3.5554, aa=0.20594, sk=2.6522, dlt0=0.0

class Polyacrylonitrile

Media properties from properties8.dat file from NIST:

- Sternheimer index: 218, label: Pacry, name: polyacrylonitrile, nice_name: polyacrylonitrile [(C%3#H%3#N)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.52767, sternheimhers_density: 1.17, corrected_density: 1.17,
- State::Solid, MediumType::Polymer, Ieff=69.6, Cbar=3.2459, X0=0.1504, x1=2.5159, aa=0.16275, sk=3.1975, dlt0=0.0

class PolycarbonateLexan

Media properties from properties8.dat file from NIST:

- Sternheimer index: 219, label: Lexan, name: polycarbonate_Lexan, nice_name: polycarbonate (Lexan, [OC%6#H%4#C(CH%3#)%2#C%6#H%4#OCO)n#]), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.52697, sternheimhers_density: 1.2, corrected_density: 1.2,
- State::Solid, MediumType::Polymer, Ieff=73.1, Cbar=3.3201, X0=0.1606, x1=2.6225, aa=0.1286, sk=3.3288, dlt0=0.0

class Polychlorostyrene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 220, label: Pchlo, name: polychlorostyrene, nice_name: polychlorostyrene [(C%17#H%18#Cl2#)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.52518, sternheimhers_density: 1.3, corrected_density: 1.3,
- State::Solid, MediumType::Polymer, Ieff=81.7, Cbar=3.4659, X0=0.1238, x1=2.9241, aa=0.0753, sk=3.5441, dlt0=0.0

class Polyethylene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 221, label: Polye, name: polyethylene, nice_name: polyethylene [(CH%2#CH%2#)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.57034, sternheimhersh_density: 0.94, corrected_density: 0.89,
- State::Solid, MediumType::Polymer, Ieff=57.4, Cbar=3.0016, X0=0.137, x1=2.5177, aa=0.12108, sk=3.4292, dlt0=0.0

class PolyethyleneTerephthalateMylar

Media properties from properties8.dat file from NIST:

- Sternheimer index: 222, label: Poly, name: polyethylene_terephthalate_Mylar, nice_name: polyethylene terephthalate (Mylar) [(C%10#H%8#O%4#)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.52037, sternheimhersh_density: 1.4, corrected_density: 1.4,
- State::Solid, MediumType::Polymer, Ieff=78.7, Cbar=3.3262, X0=0.1562, x1=2.6507, aa=0.12679, sk=3.3076, dlt0=0.0

class PolymethylmethacrylateAcrylic

Media properties from properties8.dat file from NIST:

- Sternheimer index: 223, label: Acryl, name: polymethylmethacrylate_acrylic, nice_name: polymethylmethacrylate (acrylic) [(CH%2#C(CH%3#)(COOCH%3#))n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53937, sternheimhersh_density: 1.19, corrected_density: 1.19,
- State::Solid, MediumType::Polymer, Ieff=74.0, Cbar=3.3297, X0=0.1824, x1=2.6681, aa=0.11433, sk=3.3836, dlt0=0.0

class Polyoxymethylene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 224, label: Polyox, name: polyoxymethylene, nice_name: polyoxymethylene [(CH%2#O)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53287, sternheimhersh_density: 1.425, corrected_density: 1.425,
- State::Solid, MediumType::Polymer, Ieff=77.4, Cbar=3.2514, X0=0.1584, x1=2.6838, aa=0.10808, sk=3.4002, dlt0=0.0

class Polypropylene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 225, label: Polyp, name: polypropylene, nice_name: polypropylene [(CH(CH%3#)CH%2#)n#], symbol: *Unknown*

- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55998, sternheimhersh_density: 0.94, corrected_density: 0.905,
- State::Solid, MediumType::Polymer, Ieff=57.4, Cbar=3.0016, X0=0.137, x1=2.5177, aa=0.12108, sk=3.4292, dlt0=0.0

class Polystyrene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 226, label: Polys, name: polystyrene, nice_name: polystyrene [(C%6#H%5#CHCH%2#)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53768, sternheimhersh_density: 1.06, corrected_density: 1.06,
- State::Solid, MediumType::Polymer, Ieff=68.7, Cbar=3.2999, X0=0.1647, x1=2.5031, aa=0.16454, sk=3.2224, dlt0=0.0

class PolytetrafluoroethyleneTeflon

Media properties from properties8.dat file from NIST:

- Sternheimer index: 227, label: Teflo, name: polytetrafluoroethylene_Teflon, nice_name: polytetrafluoroethylene (Teflon, [(CF%2#CF%2#)n#]), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.47992, sternheimhersh_density: 2.2, corrected_density: 2.2,
- State::Solid, MediumType::Polymer, Ieff=99.1, Cbar=3.4161, X0=0.1648, x1=2.7404, aa=0.10606, sk=3.4046, dlt0=0.0

class Polytrifluorochloroethylene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 228, label: KEL-F, name: polytrifluorochloroethylene, nice_name: polytrifluorochloroethylene [(C%2#F%3#Cl)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.48081, sternheimhersh_density: 2.1, corrected_density: 2.1,
- State::Solid, MediumType::Polymer, Ieff=120.7, Cbar=3.8551, X0=0.1714, x1=3.0265, aa=0.07727, sk=3.5085, dlt0=0.0

class Polyvinylacetate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 229, label: Pviny, name: polyvinylacetate, nice_name: polyvinylacetate [(CH%2#CHOCOCH%3#)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53432, sternheimhersh_density: 1.19, corrected_density: 1.19,
- State::Solid, MediumType::Polymer, Ieff=73.7, Cbar=3.3309, X0=0.1769, x1=2.6747, aa=0.11442, sk=3.3762, dlt0=0.0

class PolyvinylAlcohol

Media properties from properties8.dat file from NIST:

- Sternheimer index: 230, label: Pviny, name: polyvinyl_alcohol, nice_name: polyvinyl alcohol [(C%2#H3-O-H)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.5448, sternheimhershers_density: 1.3, corrected_density: 1.3,
- State::Solid, MediumType::Polymer, Ieff=69.7, Cbar=3.1115, X0=0.1401, x1=2.6315, aa=0.11178, sk=3.3893, dlt0=0.0

class PolyvinylButyral

Media properties from properties8.dat file from NIST:

- Sternheimer index: 231, label: Pviny, name: polyvinyl_butyral, nice_name: polyvinyl butyral [(C%8#H%13#O%2#)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54537, sternheimhershers_density: 1.12, corrected_density: 1.12,
- State::Solid, MediumType::Polymer, Ieff=67.2, Cbar=3.1865, X0=0.1555, x1=2.6186, aa=0.11544, sk=3.3983, dlt0=0.0

class PolyvinylchloridePvc

Media properties from properties8.dat file from NIST:

- Sternheimer index: 232, label: PVC, name: polyvinylchloride_PVC, nice_name: polyvinylchloride (PVC) [(CH%2#CHCl)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.51201, sternheimhershers_density: 1.3, corrected_density: 1.3,
- State::Solid, MediumType::Polymer, Ieff=108.2, Cbar=4.0532, X0=0.1559, x1=2.9415, aa=0.12438, sk=3.2104, dlt0=0.0

class PolyvinylideneChlorideSaran

Media properties from properties8.dat file from NIST:

- Sternheimer index: 233, label: Saran, name: polyvinylidene_chloride_Saran, nice_name: polyvinylidene chloride (Saran) [(C%2#H%2#Cl%2#)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49513, sternheimhershers_density: 1.7, corrected_density: 1.7,
- State::Solid, MediumType::Polymer, Ieff=134.3, Cbar=4.2506, X0=0.1314, x1=2.9009, aa=0.15466, sk=3.102, dlt0=0.0

class PolyvinylideneFluoride

Media properties from properties8.dat file from NIST:

- Sternheimer index: 234, label: Pvnid, name: polyvinylidene_fluoride, nice_name: polyvinylidene fluoride [(CH%2#CHF%2#)n#], symbol: *Unknown*

- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49973, sternheimhersh_density: 1.76, corrected_density: 1.76,
- State::Solid, MediumType::Polymer, Ieff=88.8, Cbar=3.3793, X0=0.1717, x1=2.7375, aa=0.10316, sk=3.42, dlt0=0.0

class PolyvinylPyrrolidone

Media properties from properties8.dat file from NIST:

- Sternheimer index: 235, label: Pvnvl, name: polyvinyl_pyrrolidone, nice_name: polyvinyl pyrrolidone [(C%6#H%9#NO)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53984, sternheimhersh_density: 1.25, corrected_density: 1.25,
- State::Solid, MediumType::Polymer, Ieff=67.7, Cbar=3.1017, X0=0.1324, x1=2.5867, aa=0.12504, sk=3.3326, dlt0=0.0

class PotassiumIodideKi

Media properties from properties8.dat file from NIST:

- Sternheimer index: 236, label: K-I, name: potassium_iodide_KI, nice_name: potassium iodide (KI), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.43373, sternheimhersh_density: 3.13, corrected_density: 3.13,
- State::Solid, MediumType::InorganicCompound, Ieff=431.9, Cbar=6.1088, X0=0.1044, x1=3.3442, aa=0.22053, sk=2.7558, dlt0=0.0

class PotassiumOxide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 237, label: K2-O, name: potassium_oxide, nice_name: potassium oxide (K%2#O), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.48834, sternheimhersh_density: 2.32, corrected_density: 2.32,
- State::Solid, MediumType::InorganicCompound, Ieff=189.9, Cbar=4.6463, X0=0.048, x1=3.011, aa=0.16789, sk=3.0121, dlt0=0.0

class Propane

Media properties from properties8.dat file from NIST:

- Sternheimer index: 238, label: Propa, name: propane, nice_name: propane (C%3#H%8#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.58962, sternheimhersh_density: 0.0018794, corrected_density: 0.001868,
- State::Gas, MediumType::OrganicCompound, Ieff=47.1, Cbar=8.7878, X0=1.4326, x1=3.7998, aa=0.09916, sk=3.592, dlt0=0.0

class LiquidPropane

Media properties from properties8.dat file from NIST:

- Sternheimer index: 239, label: Propa, name: liquid_propane, nice_name: liquid propane (C%3#H%8#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.58962, sternheimhersh_density: 0.43, corrected_density: 0.493,
- State::Liquid, MediumType::OrganicCompound, Ieff=52.0, Cbar=3.5529, X0=0.2861, x1=2.6568, aa=0.10329, sk=3.562, dlt0=0.0

class NPropylAlcohol

Media properties from properties8.dat file from NIST:

- Sternheimer index: 240, label: n-pro, name: n-propyl_alcohol, nice_name: n-propyl alcohol (C%3#H%7#OH), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.56577, sternheimhersh_density: 0.8035, corrected_density: 0.8035,
- State::Liquid, MediumType::OrganicCompound, Ieff=61.1, Cbar=3.2915, X0=0.2046, x1=2.6681, aa=0.09644, sk=3.5415, dlt0=0.0

class Pyridine

Media properties from properties8.dat file from NIST:

- Sternheimer index: 241, label: Pyrid, name: pyridine, nice_name: pyridine (C%5#H%5#N), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53096, sternheimhersh_density: 0.9819, corrected_density: 0.9819,
- State::Liquid, MediumType::OrganicCompound, Ieff=66.2, Cbar=3.3148, X0=0.167, x1=2.5245, aa=0.16399, sk=3.1977, dlt0=0.0

class RubberButyl

Media properties from properties8.dat file from NIST:

- Sternheimer index: 242, label: Rubbe, name: rubber_butyl, nice_name: rubber butyl ([C%4#H8)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.57034, sternheimhersh_density: 0.92, corrected_density: 0.92,
- State::Solid, MediumType::OrganicCompound, Ieff=56.5, Cbar=2.9915, X0=0.1347, x1=2.5154, aa=0.12108, sk=3.4296, dlt0=0.0

class RubberNatural

Media properties from properties8.dat file from NIST:

- Sternheimer index: 243, label: Rubbe, name: rubber_natural, nice_name: rubber natural [(C%5#H8)n#], symbol: *Unknown*

- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55785, sternheimhersh_density: 0.92, corrected_density: 0.92,
- State::Solid, MediumType::OrganicCompound, Ieff=59.8, Cbar=3.1272, X0=0.1512, x1=2.4815, aa=0.15058, sk=3.2879, dlt0=0.0

class RubberNeoprene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 244, label: Rubbe, name: rubber_neoprene, nice_name: rubber neoprene [(C%4#H%5#Cl)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.51956, sternheimhersh_density: 1.23, corrected_density: 1.23,
- State::Solid, MediumType::OrganicCompound, Ieff=93.0, Cbar=3.7911, X0=0.1501, x1=2.9461, aa=0.09763, sk=3.3632, dlt0=0.0

class SiliconDioxideFusedQuartz

Media properties from properties8.dat file from NIST:

- Sternheimer index: 245, label: Si-O2, name: silicon_dioxide_fused_quartz, nice_name: silicon dioxide (fused quartz) (SiO%2#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.4993, sternheimhersh_density: 2.32, corrected_density: 2.2,
- State::Solid, MediumType::InorganicCompound, Ieff=139.2, Cbar=4.0029, X0=0.1385, x1=3.0025, aa=0.08408, sk=3.5064, dlt0=0.0

class SilverBromideAgbr

Media properties from properties8.dat file from NIST:

- Sternheimer index: 246, label: Ag-Br, name: silver_bromide_AgBr, nice_name: silver bromide (AgBr), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.4367, sternheimhersh_density: 6.473, corrected_density: 6.473,
- State::Solid, MediumType::InorganicCompound, Ieff=486.6, Cbar=5.6139, X0=0.0352, x1=3.2109, aa=0.24582, sk=2.682, dlt0=0.0

class SilverChlorideAgcl

Media properties from properties8.dat file from NIST:

- Sternheimer index: 247, label: Ag-Cl, name: silver_chloride_AgCl, nice_name: silver chloride (AgCl), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.44655, sternheimhersh_density: 5.56, corrected_density: 5.56,
- State::Solid, MediumType::InorganicCompound, Ieff=398.4, Cbar=5.3437, X0=-0.0139, x1=3.2022, aa=0.22968, sk=2.7041, dlt0=0.0

class AgHalidesInPhotEmulsion

Media properties from properties8.dat file from NIST:

- Sternheimer index: 248, label: Ag-ha, name: ag_halides_in_phot_emulsion, nice_name: ag halides in phot emulsion, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.43663, sternheimhersh_density: 6.47, corrected_density: 6.47,
- State::Solid, MediumType::Mixture, Ieff=487.1, Cbar=5.6166, X0=0.0353, x1=3.2117, aa=0.24593, sk=2.6814, dlt0=0.0

class SilverIodideAgI

Media properties from properties8.dat file from NIST:

- Sternheimer index: 249, label: Ag-I, name: silver_iodide_AgI, nice_name: silver iodide (AgI), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.42594, sternheimhersh_density: 6.01, corrected_density: 6.01,
- State::Solid, MediumType::InorganicCompound, Ieff=543.5, Cbar=5.9342, X0=0.0148, x1=3.2908, aa=0.25059, sk=2.6572, dlt0=0.0

class SkinIcrp

Media properties from properties8.dat file from NIST:

- Sternheimer index: 250, label: Skin, name: skin_ICRP, nice_name: skin (ICRP), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54932, sternheimhersh_density: 1.1, corrected_density: 1.1,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=72.7, Cbar=3.3546, X0=0.02019, x1=2.7526, aa=0.09459, sk=3.4643, dlt0=0.0

class SodiumCarbonate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 251, label: Na2-C, name: sodium_carbonate, nice_name: sodium carbonate (Na₂CO₃), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49062, sternheimhersh_density: 2.532, corrected_density: 2.532,
- State::Solid, MediumType::InorganicCompound, Ieff=125.0, Cbar=3.7178, X0=0.1287, x1=2.8591, aa=0.08715, sk=3.5638, dlt0=0.0

class SodiumIodideNaI

Media properties from properties8.dat file from NIST:

- Sternheimer index: 252, label: Na-I, name: sodium_iodide_NaI, nice_name: sodium iodide (NaI), symbol: *Unknown*

- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.42697, sternheimhers_density: 3.667, corrected_density: 3.667,
- State::Solid, MediumType::InorganicCompound, Ieff=452.0, Cbar=6.0572, X0=0.1203, x1=3.592, aa=0.12516, sk=3.0398, dlt0=0.0

class SodiumMonoxide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 253, label: Na2-O, name: sodium_monoxide, nice_name: sodium monoxide (Na%2#O), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.48404, sternheimhers_density: 2.27, corrected_density: 2.27,
- State::Solid, MediumType::InorganicCompound, Ieff=148.8, Cbar=4.1892, X0=0.1652, x1=2.9793, aa=0.07501, sk=3.6943, dlt0=0.0

class SodiumNitrate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 254, label: Na-N-, name: sodium_nitrate, nice_name: sodium nitrate (NaNO%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49415, sternheimhers_density: 2.261, corrected_density: 2.261,
- State::Solid, MediumType::InorganicCompound, Ieff=114.6, Cbar=3.6502, X0=0.1534, x1=2.8221, aa=0.09391, sk=3.5097, dlt0=0.0

class Stilbene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 255, label: Stilb, name: stilbene, nice_name: stilbene (C%6#H%5#)CHCH(C%6#H%5#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.5326, sternheimhers_density: 0.9707, corrected_density: 0.9707,
- State::Solid, MediumType::OrganicCompound, Ieff=67.7, Cbar=3.368, X0=0.1734, x1=2.5142, aa=0.16659, sk=3.2168, dlt0=0.0

class Sucrose

Media properties from properties8.dat file from NIST:

- Sternheimer index: 256, label: Sucro, name: sucrose, nice_name: sucrose (C%12#H%22#O%11#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.5317, sternheimhers_density: 1.5805, corrected_density: 1.5805,
- State::Solid, MediumType::OrganicCompound, Ieff=77.5, Cbar=3.1526, X0=0.1341, x1=2.6558, aa=0.11301, sk=3.363, dlt0=0.0

class Terphenyl

Media properties from properties8.dat file from NIST:

- Sternheimer index: 257, label: Terph, name: terphenyl, nice_name: terphenyl (C%18#H%10#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.52148, sternheimhersh_density: 1.234, corrected_density: 1.234,
- State::Solid, MediumType::OrganicCompound, Ieff=71.7, Cbar=3.2639, X0=0.1322, x1=2.5429, aa=0.14964, sk=3.2685, dlt0=0.0

class TestesIcrp

Media properties from properties8.dat file from NIST:

- Sternheimer index: 258, label: Teste, name: testes_ICRP, nice_name: testes (ICRP), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55108, sternheimhersh_density: 1.04, corrected_density: 1.04,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=75.0, Cbar=3.4698, X0=0.2274, x1=2.7988, aa=0.08533, sk=3.5428, dlt0=0.0

class Tetrachloroethylene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 259, label: C2-Cl, name: tetrachloroethylene, nice_name: tetrachloroethylene (C%2#Cl4#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.48241, sternheimhersh_density: 1.625, corrected_density: 1.625,
- State::Liquid, MediumType::OrganicCompound, Ieff=159.2, Cbar=4.6619, X0=0.1713, x1=2.9083, aa=0.18595, sk=3.0156, dlt0=0.0

class ThalliumChlorideTlcl

Media properties from properties8.dat file from NIST:

- Sternheimer index: 260, label: Tl-Cl, name: thallium_chloride_TlCl, nice_name: thallium chloride (TlCl), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.40861, sternheimhersh_density: 7.004, corrected_density: 7.004,
- State::Solid, MediumType::InorganicCompound, Ieff=690.3, Cbar=6.3009, X0=0.0705, x1=3.5716, aa=0.18599, sk=2.769, dlt0=0.0

class SoftTissueIcrp

Media properties from properties8.dat file from NIST:

- Sternheimer index: 261, label: Soft, name: soft_tissue_ICRP, nice_name: soft tissue (ICRP), symbol: *Unknown*

- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55121, sternheimhersh_density: 1.0, corrected_density: 1.0,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=72.3, Cbar=3.4354, X0=0.2211, x1=2.7799, aa=0.08926, sk=3.511, dlt0=0.0

class SoftTissueIcruFourComponent

Media properties from properties8.dat file from NIST:

- Sternheimer index: 262, label: Tissu, name: soft_tissue_ICRU_four-component, nice_name: soft tissue (ICRU four-component), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54975, sternheimhersh_density: 1.0, corrected_density: 1.0,
- State::Solid, MediumType::BiologicalDosimetry, Ieff=74.9, Cbar=3.5087, X0=0.2377, x1=2.7908, aa=0.09629, sk=3.4371, dlt0=0.0

class TissueEquivalentGasMethaneBased

Media properties from properties8.dat file from NIST:

- Sternheimer index: 263, label: TE-ga, name: tissue-equivalent_gas_Methane_based, nice_name: tissue-equivalent gas (*Methane* based), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54993, sternheimhersh_density: 0.0010641, corrected_density: 0.0010641,
- State::Gas, MediumType::BiologicalDosimetry, Ieff=61.2, Cbar=9.95, X0=1.6442, x1=4.1399, aa=0.09946, sk=3.4708, dlt0=0.0

class TissueEquivalentGasPropaneBased

Media properties from properties8.dat file from NIST:

- Sternheimer index: 264, label: TE-ga, name: tissue-equivalent_gas_Propane_based, nice_name: tissue-equivalent gas (*Propane* based), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55027, sternheimhersh_density: 0.0018263, corrected_density: 0.0018263,
- State::Gas, MediumType::BiologicalDosimetry, Ieff=59.5, Cbar=9.3529, X0=1.5139, x1=3.9916, aa=0.09802, sk=3.5159, dlt0=0.0

class TitaniumDioxide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 265, label: Ti-O2, name: titanium_dioxide, nice_name: titanium dioxide (TiO%2#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.47572, sternheimhersh_density: 4.26, corrected_density: 4.26,
- State::Solid, MediumType::InorganicCompound, Ieff=179.5, Cbar=3.9522, X0=-0.0119, x1=3.1647, aa=0.08569, sk=3.3267, dlt0=0.0

class Toluene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 266, label: Tolue, name: toluene, nice_name: toluene (C%6#H%5#CH%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54265, sternheimhersh_density: 0.8669, corrected_density: 0.8669,
- State::Liquid, MediumType::OrganicCompound, Ieff=62.5, Cbar=3.3026, X0=0.1722, x1=2.5728, aa=0.13284, sk=3.3558, dlt0=0.0

class Trichloroethylene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 267, label: C2-H-, name: trichloroethylene, nice_name: trichloroethylene (C%2#HCl%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.4871, sternheimhersh_density: 1.46, corrected_density: 1.46,
- State::Liquid, MediumType::OrganicCompound, Ieff=148.1, Cbar=4.6148, X0=0.1803, x1=2.914, aa=0.18272, sk=3.0137, dlt0=0.0

class TriethylPhosphate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 268, label: Triet, name: triethyl_phosphate, nice_name: triethyl phosphate C%6#H%15#PO%4#, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.538, sternheimhersh_density: 1.07, corrected_density: 1.07,
- State::Solid, MediumType::OrganicCompound, Ieff=81.2, Cbar=3.6242, X0=0.2054, x1=2.9428, aa=0.06922, sk=3.6302, dlt0=0.0

class TungstenHexafluoride

Media properties from properties8.dat file from NIST:

- Sternheimer index: 269, label: W-F6, name: tungsten_hexafluoride, nice_name: tungsten hexafluoride (WF%6#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.42976, sternheimhersh_density: 2.4, corrected_density: 2.4,
- State::Solid, MediumType::InorganicCompound, Ieff=354.4, Cbar=5.9881, X0=0.302, x1=4.2602, aa=0.03658, sk=3.5134, dlt0=0.0

class UraniumDicarbide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 270, label: U-C2, name: uranium_dicarbide, nice_name: uranium dicarbide (UC%2#), symbol: *Unknown*

- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.39687, sternheimhersh_density: 11.28, corrected_density: 11.28,
- State::Solid, MediumType::InorganicCompound, Ieff=752.0, Cbar=6.0247, X0=-0.2191, x1=3.5208, aa=0.2112, sk=2.6577, dlt0=0.0

class UraniumMonocarbideUc

Media properties from properties8.dat file from NIST:

- Sternheimer index: 271, label: U-C, name: uranium_monocarbide_UC, nice_name: uranium monocarbide (UC), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.39194, sternheimhersh_density: 13.63, corrected_density: 13.63,
- State::Solid, MediumType::InorganicCompound, Ieff=862.0, Cbar=6.121, X0=-0.2524, x1=3.4941, aa=0.22972, sk=2.6169, dlt0=0.0

class UraniumOxide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 272, label: U-O2, name: uranium_oxide, nice_name: uranium oxide (UO₂), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.39996, sternheimhersh_density: 10.96, corrected_density: 10.96,
- State::Solid, MediumType::InorganicCompound, Ieff=720.6, Cbar=5.9605, X0=-0.1938, x1=3.5292, aa=0.20463, sk=2.6711, dlt0=0.0

class Urea

Media properties from properties8.dat file from NIST:

- Sternheimer index: 273, label: *Urea*, name: urea, nice_name: urea (CO(NH₂)₂), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.53284, sternheimhersh_density: 1.323, corrected_density: 1.323,
- State::Solid, MediumType::OrganicCompound, Ieff=72.8, Cbar=3.2032, X0=0.1603, x1=2.6525, aa=0.11609, sk=3.3461, dlt0=0.0

class Valine

Media properties from properties8.dat file from NIST:

- Sternheimer index: 274, label: Valin, name: valine, nice_name: valine (C₅H₁₁NO₂), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54632, sternheimhersh_density: 1.23, corrected_density: 1.23,
- State::Solid, MediumType::OrganicCompound, Ieff=67.7, Cbar=3.1059, X0=0.1441, x1=2.6227, aa=0.11386, sk=3.3774, dlt0=0.0

class VitonFluoroelastomer

Media properties from properties8.dat file from NIST:

- Sternheimer index: 275, label: Viton, name: viton_fluoroelastomer, nice_name: viton fluoroelastomer [(C%5#H%2#F8)n#], symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.48585, sternheimhersh_density: 1.8, corrected_density: 1.8,
- State::Solid, MediumType::Polymer, Ieff=98.6, Cbar=3.5943, X0=0.2106, x1=2.7874, aa=0.09965, sk=3.4556, dlt0=0.0

class WaterLiquid

Media properties from properties8.dat file from NIST:

- Sternheimer index: 276, label: Water, name: water_liquid, nice_name: water (liquid) (H%2#O), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55509, sternheimhersh_density: 1.0, corrected_density: 1.0,
- State::Liquid, MediumType::InorganicCompound, Ieff=79.7, Cbar=3.5017, X0=0.24, x1=2.8004, aa=0.09116, sk=3.4773, dlt0=0.0

class WaterVapor

Media properties from properties8.dat file from NIST:

- Sternheimer index: 277, label: Water, name: water_vapor, nice_name: water (vapor) (H%2#O), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55509, sternheimhersh_density: 0.00075618, corrected_density: 0.00075618,
- State::Gas, MediumType::InorganicCompound, Ieff=71.6, Cbar=10.5962, X0=1.7952, x1=4.3437, aa=0.08101, sk=3.5901, dlt0=0.0

class Xylene

Media properties from properties8.dat file from NIST:

- Sternheimer index: 278, label: Xylen, name: xylene, nice_name: xylene (C%8#H%10#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.54631, sternheimhersh_density: 0.87, corrected_density: 0.87,
- State::Liquid, MediumType::OrganicCompound, Ieff=61.8, Cbar=3.2698, X0=0.1695, x1=2.5675, aa=0.13216, sk=3.3564, dlt0=0.0

class HeavymetInAtlasCalorimeter

Media properties from properties8.dat file from NIST:

- Sternheimer index: 279, label: Heavy, name: heavymet_in_ATLAS_calorimeter, nice_name: heavymet in ATLAS calorimeter, symbol: *Unknown*

- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.40594, sternheimhersh_density: 19.3, corrected_density: 19.3,
- State::Solid, MediumType::Mixture, Ieff=727.0, Cbar=5.4059, X0=0.2167, x1=3.496, aa=0.15509, sk=2.8447, dlt0=0.14

class HeavymetInRochesterGammaStop

Media properties from properties8.dat file from NIST:

- Sternheimer index: 280, label: Heavy, name: heavymet_in_Rochester_gamma_stop, nice_name: heavymet as Rochester gamma stop, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.40915, sternheimhersh_density: 19.3, corrected_density: 19.3,
- State::Solid, MediumType::Mixture, Ieff=727.0, Cbar=5.4059, X0=0.2167, x1=3.496, aa=0.15509, sk=2.8447, dlt0=0.14

class StandardRock

Media properties from properties8.dat file from NIST:

- Sternheimer index: 281, label: Std-R, name: standard_rock, nice_name: standard rock, symbol: *Unknown*
- weight: 11.0, weight_significant_figure: 0, weight_error_last_digit: 9
- Z_over_A: 0.5, sternheimhersh_density: 2.65, corrected_density: 2.65,
- State::Solid, MediumType::Mixture, Ieff=136.4, Cbar=3.7738, X0=0.0492, x1=3.0549, aa=0.08301, sk=3.412, dlt0=0.0

class Nonsense

Media properties from properties8.dat file from NIST:

- Sternheimer index: 282, label: Hydro, name: nonsense, nice_name: Liquid hydrogen (H%2#), symbol: H
- weight: 1.008, weight_significant_figure: 3, weight_error_last_digit: 7
- Z_over_A: 0.99212, sternheimhersh_density: 0.06, corrected_density: 0.0708,
- State::Liquid, MediumType::Element, Ieff=21.8, Cbar=2.8438, X0=0.2, x1=2.0, aa=0.32969, sk=3.0, dlt0=0.0

class LiquidHelium

Media properties from properties8.dat file from NIST:

- Sternheimer index: 283, label: Helium, name: liquid_helium, nice_name: liquid helium (He), symbol: He
- weight: 4.002602, weight_significant_figure: 6, weight_error_last_digit: 2
- Z_over_A: 0.49967, sternheimhersh_density: 0.1249, corrected_density: 0.1249,
- State::Liquid, MediumType::Element, Ieff=41.8, Cbar=4.518, X0=0.4729, x1=2.0, aa=0.65713, sk=3.0, dlt0=0.0

class LiquidNitrogen

Media properties from properties8.dat file from NIST:

- Sternheimer index: 284, label: Nitro, name: liquid_nitrogen, nice_name: liquid nitrogen (N%2#), symbol: N
- weight: 14.007, weight_significant_figure: 3, weight_error_last_digit: 2
- Z_over_A: 0.49976, sternheimhersh_density: 0.807, corrected_density: 0.807,
- State::Liquid, MediumType::Element, Ieff=82.0, Cbar=3.9996, X0=0.3039, x1=2.0, aa=0.53289, sk=3.0, dlt0=0.0

class LiquidOxygen

Media properties from properties8.dat file from NIST:

- Sternheimer index: 285, label: Oxyge, name: liquid_oxygen, nice_name: liquid oxygen (O%2#), symbol: O
- weight: 15.999, weight_significant_figure: 3, weight_error_last_digit: 3
- Z_over_A: 0.50002, sternheimhersh_density: 1.141, corrected_density: 1.141,
- State::Liquid, MediumType::Element, Ieff=95.0, Cbar=3.9471, X0=0.2868, x1=2.0, aa=0.52231, sk=3.0, dlt0=0.0

class LiquidFluorine

Media properties from properties8.dat file from NIST:

- Sternheimer index: 286, label: *Fluor*, name: liquid_fluorine, nice_name: liquid fluorine (F%2#), symbol: F
- weight: 18.998403163, weight_significant_figure: 9, weight_error_last_digit: 6
- Z_over_A: 0.47372, sternheimhersh_density: 1.507, corrected_density: 1.507,
- State::Liquid, MediumType::Element, Ieff=115.0, Cbar=4.105, X0=0.2, x1=3.0, aa=0.14504, sk=3.0, dlt0=0.0

class LiquidNeon

Media properties from properties8.dat file from NIST:

- Sternheimer index: 287, label: *Neon*, name: liquid_neon, nice_name: liquid neon (Ne), symbol: Ne
- weight: 20.1797, weight_significant_figure: 4, weight_error_last_digit: 6
- Z_over_A: 0.49555, sternheimhersh_density: 1.204, corrected_density: 1.204,
- State::Liquid, MediumType::Element, Ieff=137.0, Cbar=4.6345, X0=0.2, x1=3.0, aa=0.16916, sk=3.0, dlt0=0.0

class LiquidChlorine

Media properties from properties8.dat file from NIST:

- Sternheimer index: 288, label: Chlor, name: liquid_chlorine, nice_name: liquid chlorine (Cl%2#), symbol: Cl

- weight: 35.453, weight_significant_figure: 3, weight_error_last_digit: 2
- Z_over_A: 0.47951, sternheimhershers_density: 1.574, corrected_density: 1.574,
- State::Liquid, MediumType::Element, Ieff=174.0, Cbar=4.8776, X0=0.2, x1=3.0, aa=0.18024, sk=3.0, dlt0=0.0

class LiquidArgon

Media properties from properties8.dat file from NIST:

- Sternheimer index: 289, label: *Argon*, name: liquid_argon, nice_name: liquid argon (Ar), symbol: Ar
- weight: 39.948, weight_significant_figure: 3, weight_error_last_digit: 1
- Z_over_A: 0.45059, sternheimhershers_density: 1.396, corrected_density: 1.396,
- State::Liquid, MediumType::Element, Ieff=188.0, Cbar=5.2146, X0=0.2, x1=3.0, aa=0.19559, sk=3.0, dlt0=0.0

class LiquidBromine

Media properties from properties8.dat file from NIST:

- Sternheimer index: 290, label: Bromi, name: liquid_bromine, nice_name: bromine liquid (Br%2#), symbol: Br
- weight: 79.904, weight_significant_figure: 3, weight_error_last_digit: 1
- Z_over_A: 0.43803, sternheimhershers_density: 3.1028, corrected_density: 3.1028,
- State::Liquid, MediumType::Element, Ieff=357.0, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class LiquidKryptonKr

Media properties from properties8.dat file from NIST:

- Sternheimer index: 291, label: Krypt, name: liquid_krypton_Kr, nice_name: liquid krypton (Kr), symbol: Kr
- weight: 83.798, weight_significant_figure: 3, weight_error_last_digit: 2
- Z_over_A: 0.4296, sternheimhershers_density: 2.418, corrected_density: 2.418,
- State::Liquid, MediumType::Element, Ieff=352.0, Cbar=5.9674, X0=0.4454, x1=3.0, aa=0.23491, sk=3.0, dlt0=0.0

class LiquidXenonXe

Media properties from properties8.dat file from NIST:

- Sternheimer index: 292, label: *Xenon*, name: liquid_xenon_Xe, nice_name: liquid xenon (Xe), symbol: Xe
- weight: 131.293, weight_significant_figure: 3, weight_error_last_digit: 6
- Z_over_A: 0.41129, sternheimhershers_density: 2.953, corrected_density: 2.953,
- State::Liquid, MediumType::Element, Ieff=482.0, Cbar=6.4396, X0=0.5993, x1=3.0, aa=0.26595, sk=3.0, dlt0=0.0

class SolidCarbonDioxideDryIce

Media properties from properties8.dat file from NIST:

- Sternheimer index: 293, label: C-O2, name: solid_carbon_dioxide_dry_ice, nice_name: solid carbon dioxide (dry ice, CO%2#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49989, sternheimhersh_density: 1.563, corrected_density: 1.563,
- State::Solid, MediumType::InorganicCompound, Ieff=85.0, Cbar=3.4513, X0=0.2, x1=2.0, aa=0.43387, sk=3.0, dlt0=0.0

class BubbleChamberHLiquid

Media properties from properties8.dat file from NIST:

- Sternheimer index: 294, label: Hydro, name: bubble_chamber_H_liquid, nice_name: *Hydrogen* BC liquid DEG calc to check code, symbol: H
- weight: 1.00794, weight_significant_figure: 5, weight_error_last_digit: 7
- Z_over_A: 0.99212, sternheimhersh_density: 0.06, corrected_density: 0.06,
- State::Liquid, MediumType::Element, Ieff=21.8, Cbar=3.0093, X0=0.2, x1=2.0, aa=0.35807, sk=3.0, dlt0=0.0

class WaterAsCalcFromSteamToCheckCode

Media properties from properties8.dat file from NIST:

- Sternheimer index: 295, label: Water, name: water_as_calc_from_steam_to_check_code, nice_name: water as calc from steam to check code, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55509, sternheimhersh_density: 1.0, corrected_density: 1.0,
- State::Liquid, MediumType::InorganicCompound, Ieff=71.6, Cbar=3.5017, X0=0.2, x1=2.0, aa=0.44251, sk=3.0, dlt0=0.0

class SilicaAerogel

Media properties from properties8.dat file from NIST:

- Sternheimer index: 296, label: Aerog, name: silica_aerogel, nice_name: silica aerogel for rho = 0.2 (0.03 H%2#O, 0.97 SiO%2#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.50093, sternheimhersh_density: 0.2, corrected_density: 0.2,
- State::Solid, MediumType::Mixture, Ieff=139.2, Cbar=6.4507, X0=0.6029, x1=3.0, aa=0.26675, sk=3.0, dlt0=0.0

class CarbonGemDiamond

Media properties from properties8.dat file from NIST:

- Sternheimer index: 297, label: Carbo, name: carbon_gem_diamond, nice_name: carbon (gem diamond), symbol: C

- weight: 12.0107, weight_significant_figure: 4, weight_error_last_digit: 8
- Z_over_A: 0.49955, sternheimhersh_density: 2.265, corrected_density: 3.52,
- State::Solid, MediumType::Element, Ieff=78.0, Cbar=2.868, X0=-0.0178, x1=2.3415, aa=0.26142, sk=2.8697, dlt0=0.12

class DeuteriumGas

Media properties from properties8.dat file from NIST:

- Sternheimer index: 298, label: Deute, name: deuterium_gas, nice_name: deuterium gas (D%2#), symbol: D
- weight: 2.014101764, weight_significant_figure: 9, weight_error_last_digit: 13
- Z_over_A: 0.4965, sternheimhersh_density: 0.00018, corrected_density: 0.0001677,
- State::DiatomicGas, MediumType::Element, Ieff=19.2, Cbar=9.5835, X0=1.8639, x1=3.2718, aa=0.14092, sk=5.7273, dlt0=0.0

class LiquidDeuterium

Media properties from properties8.dat file from NIST:

- Sternheimer index: 299, label: D-liq, name: liquid_deuterium, nice_name: liquid deuterium (D%2#), symbol: D
- weight: 2.014101764, weight_significant_figure: 9, weight_error_last_digit: 13
- Z_over_A: 0.4965, sternheimhersh_density: 0.1432, corrected_density: 0.1638,
- State::Liquid, MediumType::Element, Ieff=21.8, Cbar=3.2632, X0=0.4759, x1=1.9215, aa=0.13483, sk=5.6249, dlt0=0.0

class SodiumChlorideNaCl

Media properties from properties8.dat file from NIST:

- Sternheimer index: 300, label: Salt, name: sodium_chloride_NaCl, nice_name: sodium chloride (NaCl), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.4791, sternheimhersh_density: 2.165, corrected_density: 2.17,
- State::Solid, MediumType::InorganicCompound, Ieff=175.3, Cbar=4.425, X0=0.2, x1=3.0, aa=0.15962, sk=3.0, dlt0=0.0

class LeadTungstate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 301, label: PbWO4, name: lead_tungstate, nice_name: lead tungstate (PbWO%4#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.41315, sternheimhersh_density: 8.39, corrected_density: 8.3,
- State::Solid, MediumType::InorganicCompound, Ieff=600.7, Cbar=5.842, X0=0.4045, x1=3.0, aa=0.22758, sk=3.0, dlt0=0.0

class CaliforniumCf

Media properties from properties8.dat file from NIST:

- Sternheimer index: 302, label: Calif, name: californium_Cf, nice_name: californium (Cf), symbol: Cf
- weight: 251.07959, weight_significant_figure: 5, weight_error_last_digit: 3
- Z_over_A: 0.39031, sternheimhersh_density: 1.51, corrected_density: 15.1,
- State::Solid, MediumType::RadioactiveElement, Ieff=966.0, Cbar=6.3262, X0=0.5623, x1=3.0, aa=0.25796, sk=3.0, dlt0=0.0

class EinsteiniumEs

Media properties from properties8.dat file from NIST:

- Sternheimer index: 303, label: Einst, name: einsteinium_Es, nice_name: einsteinium (Es), symbol: Es
- weight: 252.083, weight_significant_figure: 4, weight_error_last_digit: 4
- Z_over_A: 0.39273, sternheimhersh_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=980.0, Cbar=6.3488, X0=0.5697, x1=3.0, aa=0.25952, sk=3.0, dlt0=0.0

class FermiumFm

Media properties from properties8.dat file from NIST:

- Sternheimer index: 304, label: Fermi, name: fermium_Fm, nice_name: fermium (Fm), symbol: Fm
- weight: 257.0951, weight_significant_figure: 5, weight_error_last_digit: 5
- Z_over_A: 0.38896, sternheimhersh_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=994.0, Cbar=6.3868, X0=0.5821, x1=3.0, aa=0.26219, sk=3.0, dlt0=0.0

class MendeleviumMd

Media properties from properties8.dat file from NIST:

- Sternheimer index: 305, label: Mende, name: mendelevium_Md, nice_name: mendelevium (Md), symbol: Md
- weight: 258.09843, weight_significant_figure: 5, weight_error_last_digit: 3
- Z_over_A: 0.39132, sternheimhersh_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1007.0, Cbar=6.4068, X0=0.5886, x1=3.0, aa=0.2636, sk=3.0, dlt0=0.0

class NobeliumNo

Media properties from properties8.dat file from NIST:

- Sternheimer index: 306, label: Nobel, name: nobelium_No, nice_name: nobelium (No), symbol: No
- weight: 259.101, weight_significant_figure: 4, weight_error_last_digit: 7

- Z_over_A: 0.39367, sternheimhersh_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1020.0, Cbar=6.4264, X0=0.595, x1=3.0, aa=0.265, sk=3.0, dlt0=0.0

class LawrenciumLr

Media properties from properties8.dat file from NIST:

- Sternheimer index: 307, label: Lawre, name: lawrencium_Lr, nice_name: lawrencium (Lr), symbol: Lr
- weight: 262.10961, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.39296, sternheimhersh_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1034.0, Cbar=6.4555, X0=0.6045, x1=3.0, aa=0.2671, sk=3.0, dlt0=0.0

class RutherfordiumRf

Media properties from properties8.dat file from NIST:

- Sternheimer index: 308, label: Ruthe, name: rutherfordium_Rf, nice_name: rutherfordium (Rf), symbol: Rf
- weight: 267.12179, weight_significant_figure: 5, weight_error_last_digit: 4
- Z_over_A: 0.38934, sternheimhersh_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1047.0, Cbar=6.4898, X0=0.6157, x1=3.0, aa=0.2696, sk=3.0, dlt0=0.0

class DubniumDb

Media properties from properties8.dat file from NIST:

- Sternheimer index: 309, label: Dubni, name: dubnium_Db, nice_name: dubnium (Db), symbol: Db
- weight: 268.12567, weight_significant_figure: 5, weight_error_last_digit: 4
- Z_over_A: 0.39161, sternheimhersh_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1061.0, Cbar=6.5105, X0=0.6224, x1=3.0, aa=0.27114, sk=3.0, dlt0=0.0

class SeaborgiumSg

Media properties from properties8.dat file from NIST:

- Sternheimer index: 310, label: Seabo, name: seaborgium_Sg, nice_name: seaborgium (Sg), symbol: Sg
- weight: 269.12863, weight_significant_figure: 5, weight_error_last_digit: 5
- Z_over_A: 0.39095, sternheimhersh_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1074.0, Cbar=6.5365, X0=0.6309, x1=3.0, aa=0.27308, sk=3.0, dlt0=0.0

class BohriumBh

Media properties from properties8.dat file from NIST:

- Sternheimer index: 311, label: Bohri, name: bohrium_Bh, nice_name: bohrium (Bh), symbol: Bh
- weight: 270.13336, weight_significant_figure: 5, weight_error_last_digit: 4
- Z_over_A: 0.3961, sternheimhersch_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1087.0, Cbar=6.5549, X0=0.6369, x1=3.0, aa=0.27447, sk=3.0, dlt0=0.0

class HassiumHs

Media properties from properties8.dat file from NIST:

- Sternheimer index: 312, label: Hassi, name: hassium_Hs, nice_name: hassium (Hs), symbol: Hs
- weight: 269.13375, weight_significant_figure: 5, weight_error_last_digit: 13
- Z_over_A: 0.40129, sternheimhersch_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1102.0, Cbar=6.5913, X0=0.6488, x1=3.0, aa=0.27724, sk=3.0, dlt0=0.0

class MeitneriumMt

Media properties from properties8.dat file from NIST:

- Sternheimer index: 313, label: Meitn, name: meitnerium_Mt, nice_name: meitnerium (Mt), symbol: Mt
- weight: 278.1563, weight_significant_figure: 4, weight_error_last_digit: 7
- Z_over_A: 0.39471, sternheimhersch_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1115.0, Cbar=6.6019, X0=0.6522, x1=3.0, aa=0.27805, sk=3.0, dlt0=0.0

class DarmstadtiumDs

Media properties from properties8.dat file from NIST:

- Sternheimer index: 314, label: Darms, name: darmstadtium_Ds, nice_name: darmstadtium (Ds), symbol: Ds
- weight: 281.1645, weight_significant_figure: 4, weight_error_last_digit: 6
- Z_over_A: 0.39123, sternheimhersch_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1129.0, Cbar=6.6357, X0=0.6632, x1=3.0, aa=0.28068, sk=3.0, dlt0=0.0

class RoentgeniumRg

Media properties from properties8.dat file from NIST:

- Sternheimer index: 315, label: Roent, name: roentgenium_Rg, nice_name: roentgenium (Rg), symbol: Rg
- weight: 282.16912, weight_significant_figure: 4, weight_error_last_digit: 7
- Z_over_A: 0.3962, sternheimhersch_density: 0.0, corrected_density: 14.0,

- State::Solid, MediumType::RadioactiveElement, Ieff=1143.0, Cbar=6.6477, X0=0.6672, x1=3.0, aa=0.28162, sk=3.0, dlt0=0.0

class CoperniciumCn

Media properties from properties8.dat file from NIST:

- Sternheimer index: 316, label: Coper, name: copernicium_Cn, nice_name: copernicium (Cn), symbol: Cn
- weight: 285.17712, weight_significant_figure: 5, weight_error_last_digit: 5
- Z_over_A: 0.39274, sternheimhersh_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1156.0, Cbar=6.6791, X0=0.6774, x1=3.0, aa=0.2841, sk=3.0, dlt0=0.0

class NihoniumNh

Media properties from properties8.dat file from NIST:

- Sternheimer index: 317, label: nihon, name: nihonium_Nh, nice_name: nihonium (Nh), symbol: Nh
- weight: 286.18221, weight_significant_figure: 5, weight_error_last_digit: 6
- Z_over_A: 0.39764, sternheimhersh_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1171.0, Cbar=6.6925, X0=0.6818, x1=3.0, aa=0.28517, sk=3.0, dlt0=0.0

class FleroviumFl

Media properties from properties8.dat file from NIST:

- Sternheimer index: 318, label: flero, name: flerovium_Fl, nice_name: flerovium (Fl), symbol: Fl
- weight: 289.19042, weight_significant_figure: 5, weight_error_last_digit: 5
- Z_over_A: 0.39421, sternheimhersh_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1185.0, Cbar=6.7249, X0=0.6923, x1=3.0, aa=0.28779, sk=3.0, dlt0=0.0

class MoscoviumMc

Media properties from properties8.dat file from NIST:

- Sternheimer index: 319, label: mosco, name: moscovium_Mc, nice_name: moscovium (Mc), symbol: Mc
- weight: 289.19363, weight_significant_figure: 5, weight_error_last_digit: 6
- Z_over_A: 0.39904, sternheimhersh_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1199.0, Cbar=6.7363, X0=0.696, x1=3.0, aa=0.28871, sk=3.0, dlt0=0.0

class LivermoriumLv

Media properties from properties8.dat file from NIST:

- Sternheimer index: 320, label: liver, name: livermorium_Lv, nice_name: livermorium (Lv), symbol: Lv
- weight: 293.2045, weight_significant_figure: 4, weight_error_last_digit: 6
- Z_over_A: 0.39563, sternheimhersh_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1213.0, Cbar=6.7571, X0=0.7028, x1=3.0, aa=0.29041, sk=3.0, dlt0=0.0

class TennessineTs

Media properties from properties8.dat file from NIST:

- Sternheimer index: 321, label: tenne, name: tennessine_Ts, nice_name: tennessine (Ts), symbol: Ts
- weight: 294.21051, weight_significant_figure: 4, weight_error_last_digit: 7
- Z_over_A: 0.39796, sternheimhersh_density: 0.0, corrected_density: 14.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=1227.0, Cbar=6.78, X0=0.7103, x1=3.0, aa=0.29231, sk=3.0, dlt0=0.0

class OganessonOg

Media properties from properties8.dat file from NIST:

- Sternheimer index: 322, label: ogane, name: oganesson_Og, nice_name: oganesson (Og), symbol: Og
- weight: 294.213922, weight_significant_figure: 5, weight_error_last_digit: 8
- Z_over_A: 0.40107, sternheimhersh_density: 0.012, corrected_density: 0.012,
- State::Gas, MediumType::RadioactiveElement, Ieff=1242.0, Cbar=13.8662, X0=2.0204, x1=-1.9972, aa=-0.07035, sk=3.0, dlt0=0.0

class AstatineAt

Media properties from properties8.dat file from NIST:

- Sternheimer index: 323, label: Astat, name: astatine_At, nice_name: astatine (At), symbol: At
- weight: 209.98715, weight_significant_figure: 5, weight_error_last_digit: 6
- Z_over_A: 0.40479, sternheimhersh_density: 0.0, corrected_density: 5.0,
- State::Solid, MediumType::RadioactiveElement, Ieff=825.0, Cbar=7.0039, X0=0.7833, x1=3.0, aa=0.31184, sk=3.0, dlt0=0.0

class FranciumFr

Media properties from properties8.dat file from NIST:

- Sternheimer index: 324, label: Franc, name: francium_Fr, nice_name: francium (Fr), symbol: Fr
- weight: 223.01974, weight_significant_figure: 5, weight_error_last_digit: 2
- Z_over_A: 0.3901, sternheimhersh_density: 1.87, corrected_density: 1.87,
- State::Solid, MediumType::RadioactiveElement, Ieff=827.0, Cbar=8.0292, X0=1.1175, x1=3.0, aa=0.43214, sk=3.0, dlt0=0.0

class WaterIce

Media properties from properties8.dat file from NIST:

- Sternheimer index: 325, label: Ice, name: water_ice, nice_name: water (ice) (H%2#O), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.55509, sternheimhersh_density: 1.0, corrected_density: 0.918,
- State::Liquid, MediumType::InorganicCompound, Ieff=79.7, Cbar=3.5017, X0=0.24, x1=2.8004, aa=0.09116, sk=3.4773, dlt0=0.0

class CarbonTetrafluoride

Media properties from properties8.dat file from NIST:

- Sternheimer index: 326, label: CF4, name: carbon_tetrafluoride, nice_name: carbon tetrafluoride (CF%4#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.47721, sternheimhersh_density: 0.00378, corrected_density: 0.00378,
- State::Gas, MediumType::OrganicCompound, Ieff=115.0, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class LanthanumBromide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 327, label: LaBr3, name: lanthanum_bromide, nice_name: lanthanum bromide (LaBr%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.42787, sternheimhersh_density: 5.29, corrected_density: 5.29,
- State::Solid, MediumType::InorganicCompound, Ieff=454.5, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class YttriumBromide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 328, label: YBr3, name: yttrium_bromide, nice_name: yttrium bromide (YBr%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.4382, sternheimhersh_density: 5.29, corrected_density: 5.29,
- State::Solid, MediumType::InorganicCompound, Ieff=410.0, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class BismuthSilicateBso

Media properties from properties8.dat file from NIST:

- Sternheimer index: 329, label: BSO, name: bismuth_silicate_BSO, nice_name: bismuth silicate (BSO) [(Bi%2#O%3#)%2#(SiO%2#)%3#], symbol: *Unknown*

- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.4226, sternheimhersh_density: 9.2, corrected_density: 7.12,
- State::Solid, MediumType::InorganicCompound, Ieff=519.2, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class LeadFluoride

Media properties from properties8.dat file from NIST:

- Sternheimer index: 330, label: PbF₂, name: lead_fluoride, nice_name: lead fluoride (PbF%2#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.40784, sternheimhersh_density: 7.77, corrected_density: 7.77,
- State::Solid, MediumType::InorganicCompound, Ieff=635.4, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class LanthanumFluoride

Media properties from properties8.dat file from NIST:

- Sternheimer index: 331, label: LaF₃, name: lanthanum_fluoride, nice_name: lanthanum fluoride (LaF%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.42879, sternheimhersh_density: 5.9, corrected_density: 5.9,
- State::Solid, MediumType::InorganicCompound, Ieff=336.3, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class CeriumFluoride

Media properties from properties8.dat file from NIST:

- Sternheimer index: 332, label: CeF₃, name: cerium_fluoride, nice_name: cerium fluoride (CeF%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.43123, sternheimhersh_density: 6.16, corrected_density: 6.16,
- State::Solid, MediumType::InorganicCompound, Ieff=348.4, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class LutetiumFluoride

Media properties from properties8.dat file from NIST:

- Sternheimer index: 333, label: LuF₃, name: lutetium_fluoride, nice_name: lutetium fluoride (LuF%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.42248, sternheimhersh_density: 8.3, corrected_density: 8.3,
- State::Solid, MediumType::InorganicCompound, Ieff=458.7, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class LanthanumChloride

Media properties from properties8.dat file from NIST:

- Sternheimer index: 334, label: LaCl3, name: lanthanum_chloride, nice_name: lanthanum chloride (LaCl%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.44034, sternheimhersh_density: 3.86, corrected_density: 3.86,
- State::Solid, MediumType::InorganicCompound, Ieff=329.5, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class LutetiumAluminumOxide1

Media properties from properties8.dat file from NIST:

- Sternheimer index: 335, label: LuAlO, name: lutetium_aluminum_oxide_1, nice_name: lutetium aluminum oxide (1) (LuAlO%3#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.43209, sternheimhersh_density: 8.3, corrected_density: 8.3,
- State::Solid, MediumType::InorganicCompound, Ieff=423.2, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class LutetiumAluminumOxide2

Media properties from properties8.dat file from NIST:

- Sternheimer index: 336, label: LuAlO, name: lutetium_aluminum_oxide_2, nice_name: lutetium aluminum oxide (2) (Lu%3#Al%5#O%12#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.43907, sternheimhersh_density: 6.73, corrected_density: 6.73,
- State::Solid, MediumType::InorganicCompound, Ieff=365.9, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class LutetiumSiliconOxide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 337, label: LuSiO, name: lutetium_silicon_oxide, nice_name: lutetium silicon oxide (Lu%2#SiO%5#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.42793, sternheimhersh_density: 7.4, corrected_density: 7.4,
- State::Solid, MediumType::InorganicCompound, Ieff=472.0, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class YttriumAluminumOxide1

Media properties from properties8.dat file from NIST:

- Sternheimer index: 338, label: YAlO-, name: yttrium_aluminum_oxide_1, nice_name: yttrium aluminum oxide (1) (YAlO%3#), symbol: *Unknown*

- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.46374, sternheimhersh_density: 5.5, corrected_density: 5.5,
- State::Solid, MediumType::InorganicCompound, Ieff=239.3, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class YttriumAluminumOxide2

Media properties from properties8.dat file from NIST:

- Sternheimer index: 339, label: YAlO-, name: yttrium_aluminum_oxide_2, nice_name: yttrium aluminum oxide (2) (Y%3#Al%5#O%12#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.46831, sternheimhersh_density: 4.56, corrected_density: 4.56,
- State::Solid, MediumType::InorganicCompound, Ieff=218.0, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class YttriumSiliconOxide

Media properties from properties8.dat file from NIST:

- Sternheimer index: 340, label: YSiO, name: yttrium_silicon_oxide, nice_name: yttrium silicon oxide (Y%2#SiO%5#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.46171, sternheimhersh_density: 4.54, corrected_density: 4.54,
- State::Solid, MediumType::InorganicCompound, Ieff=258.1, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class GadoliniumSilicate

Media properties from properties8.dat file from NIST:

- Sternheimer index: 341, label: GdSiO, name: gadolinium_silicate, nice_name: gadolinium silicate (Gd%2#SiO%5#), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.43069, sternheimhersh_density: 6.71, corrected_density: 6.71,
- State::Solid, MediumType::InorganicCompound, Ieff=405.4, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class BaksanRock

Media properties from properties8.dat file from NIST:

- Sternheimer index: 342, label: baksa, name: baksan_rock, nice_name: baksan rock, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49228, sternheimhersh_density: 2.74, corrected_density: 2.74,
- State::Solid, MediumType::InorganicCompound, Ieff=175.6, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class BaksanRockSt

Media properties from properties8.dat file from NIST:

- Sternheimer index: 343, label: bakst, name: baksan_rock_st, nice_name: baksan rock, std rock density, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49228, sternheimhersh_density: 2.74, corrected_density: 2.65,
- State::Solid, MediumType::InorganicCompound, Ieff=175.6, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class MtblancRock

Media properties from properties8.dat file from NIST:

- Sternheimer index: 344, label: MtBla, name: MtBlanc_rock, nice_name: Mt Blanc rock, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.48003, sternheimhersh_density: 2.6, corrected_density: 2.6,
- State::Solid, MediumType::InorganicCompound, Ieff=159.2, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class MtblancRockSd

Media properties from properties8.dat file from NIST:

- Sternheimer index: 345, label: MtBst, name: MtBlanc_rock_sd, nice_name: Mt Blanc rock, std rock density, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.48003, sternheimhersh_density: 2.6, corrected_density: 2.65,
- State::Solid, MediumType::InorganicCompound, Ieff=159.2, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class KgfrRockSt

Media properties from properties8.dat file from NIST:

- Sternheimer index: 346, label: KGFst, name: KGF_rock_st, nice_name: Kolar Gold Fields rock, std rock density, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.48605, sternheimhersh_density: 3.02, corrected_density: 2.65,
- State::Solid, MediumType::InorganicCompound, Ieff=183.4, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class KgfrRock

Media properties from properties8.dat file from NIST:

- Sternheimer index: 347, label: KGF, name: KGF_rock, nice_name: Kolar Gold Fields rock, symbol: *Unknown*

- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.48605, sternheimhersh_density: 3.02, corrected_density: 3.02,
- State::Solid, MediumType::InorganicCompound, Ieff=183.4, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class UdRock

Media properties from properties8.dat file from NIST:

- Sternheimer index: 348, label: UD, name: UD_rock, nice_name: UD rock for doug, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49602, sternheimhersh_density: 2.7, corrected_density: 2.7,
- State::Solid, MediumType::InorganicCompound, Ieff=145.4, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class LmpRock

Media properties from properties8.dat file from NIST:

- Sternheimer index: 349, label: LMP, name: LMP_rock, nice_name: LMP rock for Doug, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49641, sternheimhersh_density: 2.7, corrected_density: 2.7,
- State::Solid, MediumType::InorganicCompound, Ieff=145.9, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class UmRock

Media properties from properties8.dat file from NIST:

- Sternheimer index: 350, label: UM, name: UM_rock, nice_name: UM rock for Doug, symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49407, sternheimhersh_density: 2.7, corrected_density: 2.7,
- State::Solid, MediumType::InorganicCompound, Ieff=152.7, Cbar=0.0, X0=0.0, x1=0.0, aa=0.0, sk=0.0, dlt0=0.0

class DeuteriumOxideLiquid

Media properties from properties8.dat file from NIST:

- Sternheimer index: 351, label: HvWat, name: deuterium_oxide_liquid, nice_name: deuterium oxide (liquid) (D%2#O), symbol: *Unknown*
- weight: -1.0, weight_significant_figure: 5, weight_error_last_digit: 0
- Z_over_A: 0.49931, sternheimhersh_density: 1.107, corrected_density: 1.107,
- State::Liquid, MediumType::InorganicCompound, Ieff=79.7, Cbar=3.5017, X0=0.24, x1=2.8004, aa=0.09116, sk=3.4773, dlt0=0.0

group MediaProperties

Medium types are useful most importantly for effective models like energy losses.

a particular medium (mixture of components) may have specif properties not reflected by its mixture of components.

The data provided here is automatically parsed from the file properties8.dat from NIST.

The data of each known medium can be access via the global functions in namespace corsika, or via a static class object with the following interface (here at the example of the class *HydrogenGas*):

```
static constexpr Medium medium() { return Medium::HydrogenGas; }

static std::string const getName() { return data_.getName(); }
static std::string const getPrettyName() { return data_.getPrettyName(); }
static double getWeight() { return data_.getWeight(); }
static int weight_significant_figure() { return data_.weight_significant_figure_
↪(); }
static int weight_error_last_digit() { return data_.weight_error_last_digit(); }
static double Z_over_A() { return data_.Z_over_A(); }
static double getSternheimerDensity() { return data_.getSternheimerDensity(); }
static double getCorrectedDensity() { return data_.getCorrectedDensity(); }
static State getState() { return data_.getState(); }
static MediumType getType() { return data_.getType(); }
static std::string const getSymbol() { return data_.getSymbol(); }

static double getIeff() { return data_.getIeff(); }
static double getCbar() { return data_.getCbar(); }
static double getX0() { return data_.getX0(); }
static double getX1() { return data_.getX1(); }
static double getAA() { return data_.getAA(); }
static double getSK() { return data_.getSK(); }
static double getDlt0() { return data_.getDlt0(); }

inline static const MediumData data_ { "hydrogen_gas", "hydrogen gas (H%2#)", 1.
↪008,
3, 7, 0.99212,
8.3748e-05, 8.3755e-05, State::DiatomicGas,
MediumType::Element, "H", 19.2, 9.5835, 1.8639, 3.2718, 0.14092, 5.7273, 0.0 };
```

The numeric data known to CORSIKA 8 (and obtained from NIST) can be browsed below.

Typedefs

```
MediumIntType = int16_t std::underlying_type< Medium >::type
```

Enums

```
enum MediumType
```

General type of medium.

Values:

```
enumerator Unknown
enumerator Element
enumerator RadioactiveElement
enumerator InorganicCompound
enumerator OrganicCompound
enumerator Polymer
enumerator Mixture
enumerator BiologicalDosimetry
```

```
enum State
```

Physical state of medium.

Values:

```
enumerator Unknown
enumerator Solid
enumerator Liquid
enumerator Gas
enumerator DiatomicGas
```

```
struct corsika::MediumData
```

#include <MediumProperties.hpp> Simple object to group together the properties of a medium.

MediumDataInterface Interface methods

Interface functions for *MediumData*

```
inline std::string getPrettyName () const
    returns name
```

```
inline double getWeight () const
    returns pretty name
```

```
inline const int &weight_significant_figure () const
    return weight
```

```
inline const int &weight_error_last_digit () const
    return significnat figures of weight
```

```
inline const double &Z_over_A () const
    return error of weight
```

```
inline double getSternheimerDensity() const
    Z_over_A_.

inline double getCorrectedDensity() const
    Sternheimer density.

inline State getState() const
    corrected density

inline MediumType getType() const
    state

inline std::string getSymbol() const
    type

inline double getIeff() const
    symbol

inline double getCbar() const
    Ieff.

inline double getX0() const
    Cbar.

inline double getX1() const
    X0.

inline double getAA() const
    X1.

inline double getSK() const
    AA.

inline double getDlt0() const
    Sk.
```

PHYSICS UNITS

Not yet documented in sphinx. Check doxygen, examples, tests.

GEOMETRY AND ENVIRONMENT

Not yet documented in sphinx. Check doxygen, examples, tests.

PARTICLE STORAGE IN MEMORY

Not yet documented in sphinx. Check doxygen, examples, tests.

FULL API

Consider using Doxygen directly for a full API reference. . . .

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