

Radioisotopes of significance to environmental radioactivity

^{240}Pu

^{239}Pu

^{238}Pu

Plutonium (Pu)

Element classification: Actinide

No. of isotopes: 15

Typical elemental concentrations:

Soil (dry): 0.05-1.4 Bq/kg

Sea water: 0.0075-0.21 Bq/l



Behaviour in the Environment

- ◆ A variety of species in waters, having mainly the valence of 3, 4, 5 or 6.
- ◆ Binds to bottom sediments and suspended solids in water
- ◆ Most important isotopes found in the environment: Pu-238, Pu-239, Pu-240, Pu-241.
- ◆ Both alpha- and beta-emitting isotopes
- ◆ Very toxic to mammals

Plutonium

radioecology

Key sources

- ◆ **Nuclear cycle:** Nuclear power plants, reprocessing, waste
- ◆ **Nuclear accidents:** e.g. Chernobyl, Fukushima
- ◆ **Natural sources:** None



Why is it of interest?

- ◆ Man made element
- ◆ Earlier main production for making atomic bombs
- ◆ Some isotopes are really long lived
- ◆ Both radiotoxic and chemically toxic
- ◆ Highly radiotoxic

For more information ...

[IRSN \$^{239}\text{Pu}\$ factsheet](#)