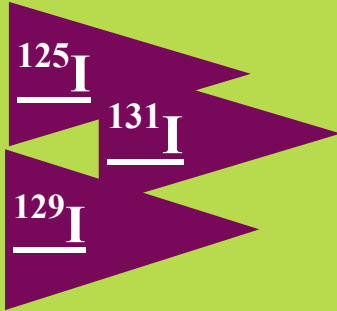


Radioisotopes of significance to environmental radioactivity



Iodine (I)

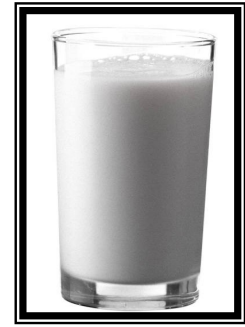
Element classification: Halogen

No. of isotopes: 37 (^{127}I is stable)

Typical elemental concentrations:

Soil: 2-10 mg kg⁻¹

Sea water: 45-65 µg L⁻¹



Behaviour in the Environment

- ◆ Essential for thyroid hormone synthesis
- ◆ Accumulates in the thyroid gland
- ◆ Completely absorbed from animal gut
- ◆ Disperses in water with little binding to sediments
- ◆ Limited binding to soil so migrates to groundwater
- ◆ Limited translocation when deposited onto plant surfaces
- ◆ Chemically similar to F, Cl and Br
- ◆ Accumulates in some marine macro algae (e.g. *Laminaria Spp.*)

Iodine

radioecology

Key sources of radioisotopes

- ◆ **Nuclear cycle:** Nuclear power plants, reprocessing, waste
- ◆ **Fallout:** Nevada test site, Marshall Islands
- ◆ **Nuclear accidents:** e.g. Chernobyl , Fukushima Daiichi, Windscale
- ◆ **Natural sources:** I-129 is produced in the high atmosphere and also by spontaneous fission of natural U in rock

Why is it of interest?

- ◆ High transfer to milk
- ◆ Restrictions were placed on the sale/use of contaminated food-stuffs after the Chernobyl & Fukushima Daiichi accidents
- ◆ I-129 is used as a tracer in oceanography
- ◆ Increased child thyroid cancers following Chernobyl
- ◆ Medical usage



For more information ...

[IRSN ¹²⁹I factsheet](#)

[ATSDR profile for I Remediation](#)