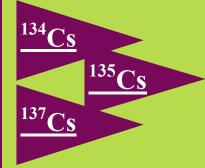


Radioisotopes of significance to environmental radioactivity



Caesium (Cs)

Element classification: Alkali metal **No. of isotopes:** 40 (¹³³Cs is stable) **Typical elemental concentrations:**

Soil (dry): \sim 0.3-25 mg/kg Sea water: \sim 0.2-0.5 µg/l



Behaviour in the Environment

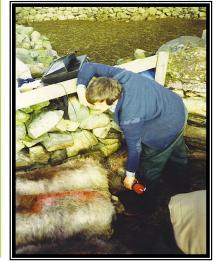
- Similar bio-geochemically to K and Rb
- Low mobility in mineral soils: binds to clay particles
- More mobile in organic soils
- Highly available for plant uptake, lower uptake in cereal grains
- Highly bio-available to animals, migrates easily across cells
- Distributes evenly throughout muscle and soft tissues
- Binds to bottom sediments and suspended solids in water
- Concentrations in sea water higher than in fresh water

Caesium

radioecology

Key sources of radioisotopes

- Nuclear cycle: Nuclear power plants, reprocessing, waste
- Fallout: Nuclear weapons testing
- ◆ Nuclear accidents: e.g. Windscale, <u>Chernobyl</u>, <u>Fukushima Daiichi</u>
- ◆ Natural sources: None



Why is it of interest?

- Easily transferred to food products—intervention was required following Chernobyl & Fukushima
- ◆ Some long lived isotopes (¹³⁷Cs, esp. ¹³⁵Cs)
- Major contributor to dose
- ♦ Has low boiling point making it environmentally mobile & important in atmospheric releases

For more information ...

IRSN 137Cs factsheet

ATSDR profile for Cs

Remediation