Strontium

radioecology

Radioisotopes of significance to environmental radioactivity

^{85}Sr

^{90}Sr

^{89}Sr

Strontium

Element classification: Alkali metal

No. of isotopes: 35
(^{84}Sr, ^{86}Sr, ^{87}Sr, ^{88}Sr are stable)

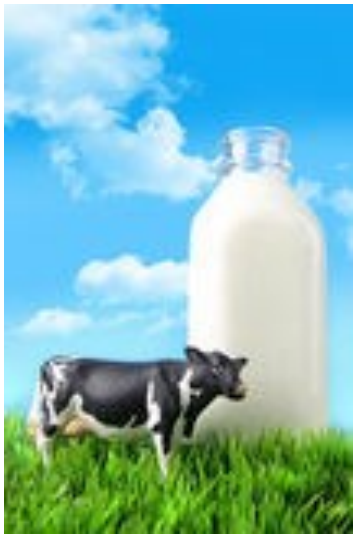
Typical elemental concentrations:
Soil (dry): ~50—1000 µg/kg

Behaviour in the Environment

- Biogeochemically similar to Ca and Ba
- Naturally occurring Sr isotopes are not radioactive (^{84}Sr, ^{86}Sr, ^{87}Sr, ^{88}Sr)
- Bound strongly to soil organic matter
- Mobility and biotic uptake is higher than Cs in mineral soils
- Sr competes with and is exchanged for Ca in soil and biota
- Sr accumulates in teeth and bones of animals and associates strongly with the cell wall in plants

Key sources of radioisotopes

- **Nuclear cycle:** Nuclear power plants, reprocessing, waste
- **Fallout:** Nuclear weapons testing in the 1950's and 1960's
- **Nuclear accidents:** Chernobyl
- **Natural:** Exists in igneous rocks



Why is it of interest?

- Long lived isotope - ^{90}Sr (29 years)
- Biological half-life in body is ~30y
- Primary pathway for ^{90}Sr to enter the body is via contaminated foods and cow's milk
- ^{90}Sr mimics Ca in the body and can store in bones and teeth, increasing risk of disease including cancer
- Strong beta radiation from Sr's decay product, ^{90}Y, contributes to dose

For more information ...

IRSN ^{90}Sr environmental factsheet

IRSN ^{90}Sr health factsheet