Strontium
Element classification: Alkali metal
No. of isotopes: 35
\(^{84}\text{Sr}, \, ^{86}\text{Sr}, \, ^{87}\text{Sr}, \, ^{88}\text{Sr}\) are stable
Typical elemental concentrations:
Soil (dry): ~50—1000 µg/kg

Why is it of interest?
◆ Long lived isotope - \(^{90}\text{Sr}\) (29 years)
◆ Biological half-life in body is ~30y
◆ Primary pathway for \(^{90}\text{Sr}\) to enter the body is via contaminated foods and cow’s milk
◆ \(^{90}\text{Sr}\) 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, \(^{90}\text{Y}\), contributes to dose

Radioisotopes of significance to environmental radioactivity

Strontium

radioecology

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

Behaviour in the Environment
◆ Biogeochemically similar to Ca and Ba
◆ Naturally occurring Sr isotopes are not radioactive (\(^{84}\text{Sr}, \, ^{86}\text{Sr}, \, ^{87}\text{Sr}, \, ^{88}\text{Sr}\))
◆ 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

For more information ...

IRSN \(^{90}\text{Sr}\) environmental factsheet
IRSN \(^{90}\text{Sr}\) health factsheet

www.radioecology-exchange.org