STAR
STRATEGY FOR ALLIED RADIOECOLOGY

Radioisotopes of significance to environmental radioactivity

^{36}Cl

Chlorine

Element classification: halogen

No. of isotopes: 14 (^{35}Cl and ^{37}Cl are stable)

Typical elemental concentrations:

Soil: 30 to > 100 mg /kg dw

Seawater: 19 g /L

Freshwater: 7 mg /L

Behaviour in the Environment

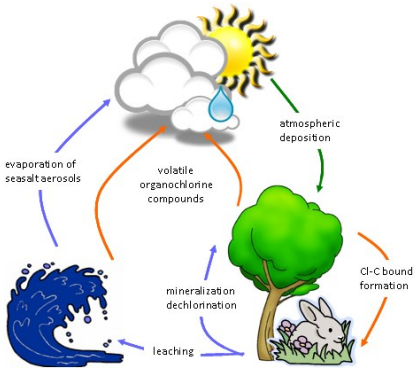
- Main chemical forms: chloride ion (Cl^-)
- Follows the chlorine cycle (high input of sea salt)
- Isotopic equilibrium (^{35}Cl/^{36}Cl) achieved in the environment
- High geochemical mobility in both geosphere and biosphere (aqueous transport)
- Specific behaviour of organically bound chlorine produced naturally (e.g. in soils) or by industries (e.g. PCB)

Chlorine-36

radioecology

Key sources

- **Nuclear cycle:** Nuclear power plants, reprocessing, waste
- **Fallout:** Nuclear weapons testing (activation of stable Cl)
- **Others:** Research applications
- **Natural sources:** reactions of cosmic rays with atmospheric argon, reactions of neutrons emitted by decay chain of uranium (subsoil) with ^{35}Cl (stable isotope)



Why is it of interest?

- Element essential to life
- Naturally transferred to any biological tissues
- Potential for incorporation in cellular components
- Very long half-life and very mobile in the environment

For more information ...

IRSN ^{36}Cl factsheet

ANL ^{36}Cl factsheet

Remediation