

Radioisotopes of significance to environmental radioactivity

^{129m}Te

^{132}Te

Tellurium (Te)

Element classification: Metalloid
No. of isotopes: 38 (8 natural; 5 stable)
Typical elemental concentrations:
 Soil (natural): $\sim 1\mu\text{g/kg}$



Behaviour in the Environment

- ◆ Very low natural abundance
- ◆ Natural radioisotope abundance exceeds that of stable isotopes
- ◆ ^{128}Te has the longest half-life of any known radioisotope (2.2×10^{24} y)
- ◆ Chemical behavior similar to sulphur and selenium
- ◆ Immobile in soil
- ◆ Mild chemical toxicity

Tellurium

radioecology

Key sources

- ◆ Nuclear fuel reprocessing
- ◆ Atmospheric nuclear weapons tests
- ◆ Accidental release from nuclear reactors: Chernobyl, Fukushima



Why is it of interest?

- ◆ ^{132}Te decays to ^{132}I —a high energy β emitter
- ◆ Major contributor (with ^{132}I) to exposures in the first few days following release from a damaged nuclear reactor
- ◆ Distributed worldwide in air
- ◆ ^{129m}Te and ^{132}Te have very short half-lives