



## Radioisotopes of significance to environmental radioactivity

$^{57}\text{Co}$

$^{60}\text{Co}$

### Cobalt (Co)

**Element classification:** Transition metal

**No. of isotopes:** 28 (1 stable, 1 natural)

**Typical elemental concentrations:**

Soil (dry): 0.1-70  $\mu\text{g}/\text{kg}$

Sea water: 0.39  $\mu\text{g}/\text{l}$

Fresh water: 2 - 107  $\mu\text{g}/\text{l}$



### Behavior in the Environment

- ◆ Exists naturally only in a chemically combined form
- ◆ Often associated with nickel
- ◆ Associated with sediment and suspended particles in water
- ◆ Essential to all animals— key constituent of vitamin B<sub>12</sub>



# Cobalt

*radioecology*

### Key sources of radioisotopes

- ◆ Nuclear cycle: Nuclear power plants, reprocessing, waste
- ◆ Production and reclamation of radioactive sources for medical and industrial irradiation and scanning equipment ( $^{60}\text{Co}$ )
- ◆ Medical wastes ( $^{57}\text{Co}$ )

### Why is it of interest?

- ◆  $^{60}\text{Co}$  decay gives off very high energy gamma
- ◆  $^{60}\text{Co}$  is a common radioisotope used in irradiation devices for research or medical purposes
- ◆ Can contaminate steel during metal recycling

For more information ...

[IRSN  \$^{60}\text{Co}\$  environment sheet](#)

[IRSN  \$^{60}\text{Co}\$  health sheet](#)

