

RADIONUCLIDE DATA SHEET

[IRON]

Fe-59

26 protons

33 neutrons

Half Life: 44.51 days

Radiation: Decay Mode: Beta

Gamma Constant: 7.35 mR/hr per 1 mCi at 30 cm

Major Betas:

| Max E(MeV) | Avg E (MeV) | # per 100 dis |
|------------|-------------|---------------|
| 0.131 | 0.036 | 1 |
| 0.273 | 0.081 | 45 |
| 0.466 | 0.149 | 53 |

Max. Beta Range in Air : 150 cm

Max. Beta Range in Water : 0.16 cm

Major Gammas:

| E(MeV) | # per 100 Dis |
|--------|---------------|
| 0.192 | 3 |
| 1.099 | 57 |
| 1.292 | 43 |

Average gamma E = 1.140 MeV

Intake Data (annual):

Minimum Ingestion: 800 μ Ci equals 5 rem TEDE (WHOLE BODY)

Minimum Inhalation: 300 μ Ci equals 5 rem TEDE (WHOLE BODY)

Doses:

Skin Dose: Reported for 1 μ Ci over 10 cm² of skin
20.0 mrad/hr (gamma dose)

Point Source: 397 mrad/hr (beta dose)

Disk Source: 400 mrad/hr (beta dose)

Shielding Information:

| | | |
|--|----------|---------|
| Maximum Range For Beta | Plastic | 0.16 cm |
| | Aluminum | 0.08 cm |
| Tenth Value Thickness For Average Gamma: | Concrete | 18 cm |
| | Lead | 3.1 cm |

Detection information: Usable Detectors listed with estimate efficiencies

| | | | |
|------------------------------------|-----|---------------------|-----|
| Ludlum 3 w/ pancake probe at 1 cm | 11% | Liq. Scint. Counter | 85% |
| Ludlum 3 w/ NaI probe near surface | 1% | Gamma Counter | 60% |

Action Quantities:

| | |
|--|---------------|
| Bench Top Quantity Must Be Less Than | 3000 μ Ci |
| Containers Require Labeling When Greater Than | 10 μ Ci |
| Rooms Require Posting When There Is Greater Than | 100 μ Ci |
| Contamination Lasting More than 24 hrs Require NRC Notification At | 1500 μ Ci |