

RADIONUCLIDE SAFETY DATA SHEET

NUCLIDE: Fe-55

FORMS: SOLUBLE

PHYSICAL CHARACTERISTICS:

HALF-LIFE: 2.7 YEARS

TYPE DECAY: x-ray:
maximum energies: K X-ray 6 keV (27.8 %)
Auger e⁻ 5 keV (60.7%)

Hazard category: C- level (low hazard) : 0.1 to 20 mCi
B - level (Moderate hazard) : > 20mCi to 1.0 Ci
A - level (High hazard) : greater than 1.0 Ci

EXTERNAL RADIATION HAZARDS AND SHIELDING:

Fe-55 emits low energy x-rays and electrons that are strongly absorbed in the dead outer skin layer. The use of protective clothing should provide sufficient protection against external exposure

HAZARDS IF INTERNALLY DEPOSITED:

In adult man about 70% of total body iron is bound in hemoglobin. It may be assumed that 80% and 1.3% of Fe-55 uptakes transfer to the liver and spleen respectively. The rest is assumed to be uniformly distributed to all other organs and tissues of the body. Iron is retained in organs and tissues with a biological half-life of 2000 days. One or two percent of an uptake of Fe-55 is eliminated in urine during the first 24 hours, the rest is eliminated in feces.

Annual limit on intake is 9 mCi for oral ingestion and 2 mCi for inhalation

Contamination of facilities and bodies is a hazard with nuclide because of the long half-life -- use of gloves and frequent monitoring while working are important.

DOSIMETRY AND BIOASSAY REQUIREMENTS:

Film badges and finger dosimeters are not appropriate for monitoring Fe-55 exposure.

Urine assays may be required after spills or contamination incidents.

SPECIAL PROBLEMS AND PRECAUTIONS:

1. Always wear protective gloves to keep contamination from skin. Change gloves often. Use tools to indirectly handle unshielded sources and potentially contaminated vials.
2. Handle potentially volatile compounds and powder in the fume hood.
3. Use open-window proportional counter, NaI(Tl) detector or liquid scintillation counter to conduct survey of the work areas at conclusion of work. Instrument surveys and smear surveys in uncontrolled areas are appropriate. Maintain contamination control of clothing.
4. Store mCi quantities of Fe-55 behind lead shielding.
5. Segregate wastes