

RADIONUCLIDE SAFETY DATA SHEET

NUCLIDE: Gd-153

FORMS: ALL SOLUBLE

PHYSICAL CHARACTERISTICS:

HALF-LIFE: 241.6 days

TYPE DECAY: e⁻ capture

gamma: 0.041 MeV (35.8 %)
0.042 MeV (64.7 %)
0.047 MeV (25.3 %)
0.070 MeV (2.57 %)
0.084 MeV (0.22 %)
0.097 MeV (31.3 %)
0.103 MeV (22.2 %)

beta: 0.103 MeV maximum

Hazard category: C- level (low hazard) : 10 uCi to 1 mCi

B - level (Moderate hazard) : > 1 mCi to 100 mCi

A - level (High hazard) : > 100 mCi

EXTERNAL RADIATION HAZARDS AND SHIELDING:

The gamma exposure rate at 1 cm from 1 mCi is 872 mR/hr. The exposure rate varies directly with activity and inversely as the square of the distance. The beta absorbed dose rate at 1 cm from 1 mCi is 157.5 R/hr. The range of the 0.103 MeV beta is 0.012 cm in lucite and 0.0057 cm in glass.

HAZARDS IF INTERNALLY DEPOSITED:

The annual limit on oral intake (ALI) of Gd153 corresponding to a whole-body guideline gamma exposure rate of 500 mrem/year is 540 uCi.

DOSIMETRY AND BIOASSAY REQUIREMENTS:

Film badges and dosimeter rings are required if 5 millicuries are handled at any one time or 1 millicurie levels are handled on a frequent (daily) basis.

Urine assays may be required after spill or contamination incidents.

SPECIAL PROBLEMS AND PRECAUTIONS:

1. When 1 millicurie is used, work behind lucite and lead shielding. Survey frequently. Handle stock solution vials in shields or use tongs or forceps. Change gloves often.
2. Segregate wastes to those with half-lives greater than 90 days (but not with H3 and/or C14).
3. Dilute aqueous wastes may be disposed to the sewer system in amounts of up to 10 uCi daily per lab.