

## RADIONUCLIDE SAFETY DATA SHEET

NUCLIDE: Ba-133

FORMS: SOLUBLE

### PHYSICAL CHARACTERISTICS:

HALF-LIFE: 10.74 YEARS

TYPE DECAY: e<sup>-</sup> capture

maximum energies: Beta<sup>-</sup> 0.32 MeV (1.5%)  
Energies of photons MeV (intensity %/d): .031 (.969), .035 (22.6%),  
.053 (2%), .0796 (3%), .081 (34%), .276 (7%), .303 (18%),  
.356 (62%), .383 (9%)

Hazard category: C- level (low hazard) : .010 to 1.0 mCi  
B - level (Moderate hazard) : > 1.0 mCi to 100 mCi  
A - level (High hazard) : greater than 100 mCi

### EXTERNAL RADIATION HAZARDS AND SHIELDING:

The gamma exposure constant is about 3.0 R-cm<sup>2</sup>/mCi-hr. The amount of lead necessary to reduce the exposure rate by a factor of ten is 0.5 cm. The beta dose at 1 cm from 1 mCi is insignificant.

### HAZARDS IF INTERNALLY DEPOSITED:

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 must be worn when handling mCi amounts of Ba<sup>133</sup>.

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.
2. Survey work areas at conclusion of work. Instrument surveys and smear surveys in uncontrolled areas are appropriate. Shielding may be required.
3. Segregate wastes to those with half-lives of greater than 90 days (but not with H3 and/or C14). Check radiation dose rates around waste containers, rates should be less than 2 mR/hr at 1 foot.
4. Limit of soluble waste to sewer to 10 microcuries/ day per lab.