Mercury-203

**Physical Characteristics**

**Half-life:** 47 days  
**Emissions:** Beta particles: 0.210 MeV maximum energy (100 %) and 0.070 MeV average energy.  
**Gamma rays:** 0.279 MeV (100%).  
**Beta Maximum Range:** 34 cm in air; 0.04 cm in tissue; 0.04 cm in plexiglas

**Dose and Shielding**

**Dose rate to the skin at 30 cm:** 15.2 mrem/hour/mCi (for an unshielded point source)  
**Gamma Dose rate (deep tissue dose) at 30 cm:** 1.63 mrem/hour/mCi (for an unshielded point source)  
**Dose rate to epidermal basal cells from skin contamination of 1 µCi/cm²:** 3296 mrem/hour  
**Shielding:** Shield stock vials with lead.  
**Half-Value Layer:** 0.2 cm lead  
The half-value layer is the amount of material required to reduce the radiation intensity by 50%.  
**Annual Limit on Intake (ALI):** 500 microcuries via ingestion and 800 microcuries via inhalation. The intake of one ALI will produce a dose of 5 rem.

**Detection**

A G-M detector will readily detect low-level Hg-203 contamination, although liquid scintillation counting is also an acceptable method for detecting removable contamination.

**Precautions**

High localized doses are possible while handling millicurie amounts of Hg-203 and as a result of skin contamination. Reduce doses by wearing safety glasses (for shielding the eyes), using remote handling tools such as tongs, using shielding extensively to shield storage and experimental containers and work areas, and performing thorough and frequent surveys of the work area, clothing and the body.

**Radiation Monitoring Requirements:** Radiation monitoring badges must be worn by any person who uses open sources of Hg-203 in amounts of 0.5 mCi or more for extended operations (applies to most operations other than simple aliquoting from a stock vial).

**Waste Disposal**
**Solid Wastes:** through the Decay-in-Storage Program

**Liquid Wastes:** through the Sewer Disposal Program. The monthly secondary disposal limit is 3 mCi.