

51 r	Nuclide Safety Data Sheet Chromium-51 www.nchp.org	51 r
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I. PHYSICAL DATA

Radiation: Gamma 320 keV (9.8% abundance)
X-ray 5 keV (22% abundance)

Gamma Constant: 0.023 mR/h per mCi @ 1.0 meter [6.32E-6 mSv/h per MBq @ 1.0 meter]¹

Half-Life [T_{1/2}]: Physical T_{1/2}: 27.7 days
Biological T_{1/2}: 615 days
Effective T_{1/2}: 15.6 days (whole body)

Specific Activity: 9.24E4 Ci/g [3.42E3 TBq/g] max.

II. RADIOLOGICAL DATA

Radiotoxicity: 0.145 mrem/uCi of ⁵¹Cr ingested [CE E]
0.334 mrem/uCi of ⁵¹Cr inhaled [CE E]

Critical Organ: Lower Large Intestine [LLI]

Intake Route: Ingestion, inhalation, puncture, wound, skin contamination (absorption);

Radiological Hazard: External Internal Exposure; Contamination

III. SHIELDING

	Half Value Layer [HVL]	Tenth Value Layer [TVL]
Lead [Pb]	2 mm (0.07 inches)	6.6 mm (0.23 inches)
Concrete	2.6 cm (1.1 inches)	9.3 cm (3.7 inches)
Plexiglas	4.8 cm (1.9 inches)	16 cm (6.3 inches)

The acceptable dose rate should be background but must be < 2 mR/h

IV. DOSE METER MONITORING

Always wear radiation dose monitoring badge [body ring] whenever handling ⁵¹Cr

V. DETECTION & MEASUREMENT

Portable Survey Meter: Geiger-Mueller [e.g. Ikon FGM] to assess shielding effectiveness
Low Energy Gamma Detector [e.g. Ludlum 44-21] for contamination survey

Wipe Test: Liquid Scintillation Counter

VI. PRACTICAL PRECAUTION

- Store ⁵¹Cr (including waste) behind lead shielding [1/4 - 1/2 inch thick]; survey (with GM meter) to check adequacy of shielding (acceptable dose rate < 2 mR/h; should be background)
- Avoid skin contamination [absorption], ingestion, inhalation, injection [all routes of intake]
- Use shielding to minimize exposure while handling ⁵¹Cr
- Use tool to handle ⁵¹Cr source and contaminated object; avoid direct hand contact

¹ Health Physics & Radiological Health Handbook, 3rd Ed. [Baltimore, MD; Williams & Wilkins, 199], p. 6-9

VII. C

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