



Canadian Nuclear Safety Commission Radiation Safety Data Sheet

This data sheet presents information on radioisotopes only.

For information on chemical compounds incorporating this radionuclide, see the relevant Material Safety Data Sheet.

Part 1 - RADIOACTIVE MATERIAL IDENTIFICATION

Chemical Symbol:	Mo	Common Names:	Molybdenum
Atomic Weight:	99	Atomic Number:	42

*Please also see Radiation Safety Data Sheet for Tc-99m

Part 2 - RADIATION CHARACTERISTICS

Physical Half-Life:	66 hours	
Unconditional Clearance Levels:	Activity Concentration (Bq/g)	1×10^1
CNSC Exemption Quantity:	Activity Concentration (Bq/g)	1×10^2
	Activity (Bq)	1×10^6

Principal Emissions	Average Energy of Most Abundant Emission (MeV)	Maximum Energy of Most Abundant Emission (MeV)	Gamma-Ray Dose Rate at 1m Distance (mSv/h per GBq) ¹	Shielding Information ²
Neutrons	-	-	-	-
Gamma & X-ray	0.7395	-	0.031	Half-value layer (lead): 1 mm
Beta* & Electron	0.4426	1.23	-	Total absorption: 2.2 mm glass or 4.0 mm plastic
Alpha	-	-	-	-

* Where beta radiation is present, bremsstrahlung radiation will be produced. Shielding for bremsstrahlung radiation must be considered.

¹Shleien, B. et al, Handbook of Health Physics and Radiological Health Third Edition, 1998.

²Delacroix, D. et al, Radionuclide and Radiation Protection Data Handbook 2002.

Progeny	Tc-99m(6.02 h), Tc-99(2.13E5 y)
----------------	---------------------------------

Part 3 - DETECTION AND MEASUREMENT

Method of Detection:

Gamma probe (e.g., NaI scintillation detector)
 Beta probe (e.g., thin window Geiger-Mueller detector)

Dosimetry:

External: TLD (whole body & skin) Extremity Neutron _____
 Internal: Whole body Thyroid _____ Urine analysis Other (specify) _____

Part 4 - PREVENTATIVE MEASURES

Molybdenum dust or powder is flammable.

Recommended protective clothing: When working with unsealed sources wear appropriate protective clothing, such as laboratory coats (which must be monitored before leaving the laboratory), coveralls, gloves, and safety glasses/goggles. Use a suitable mask if the radioactive material is in the form of a dust, powder or if it is potentially volatile.

Optimize time, distance, shielding. Monitor equipment and supplies for loose contamination before removing from laboratory. Use disposable absorbent liners on trays.

Consult CNSC license for requirements concerning engineering controls, protective equipment, and special storage requirements.

Part 5 - ANNUAL LIMIT ON INTAKE

Compound Type	Ingestion		Inhalation	
	Unspecified compounds	Sulphide	Unspecified compounds	Oxides, hydroxides, MoS ₂
Annual Limit on Intake (Bq)	2.7×10^7	1.7×10^7	5.6×10^7	1.8×10^7



EMERGENCY PROCEDURES

The following is a guide for first responders. The following actions, including remediation, should be carried out by qualified individuals. In cases where life threatening injury has resulted, **first** treat the injury, **second** deal with personal decontamination. In the case of an emergency, the Radiation Safety Officer should be contacted as soon as practicable.

Personal Decontamination Techniques

- Wash well with soap and water and monitor skin
- Do Not abrade skin, only blot dry
- Decontamination of clothing and surfaces are covered under operating and emergency procedures

Spill and Leak Control

- Alert everyone in the area
- Clear area
- Summon Aid

Emergency Protective Equipment, Minimum Requirements

- Gloves
- Footwear Covers
- Safety Glasses
- Outer layer or easily removed protective clothing
- Suitable respirator selected

Canadian Nuclear Safety Commission
P.O. Box 1046, Station B
Ottawa, Canada
K1P 5S9

Tel: (613) 995-5894 Fax: (613) 995-5086
24 Hour Emergency Hotline: (613) 995-0479

Revision number: 1

Date of revision: 19 September 2011