

MATERIAL SAFETY DATA SHEET

Section 1 - Identification

Product identifier	1,7-Bis(tert-butoxycarbonylmethyl)-1,4,7,10-tetraazacyclododecane
Catalog No.	AS4228
CAS No.	162148-48-3
Recommended use	Laboratory research and chemical synthesis; macrocyclic chelator and DOTA-related synthesis as applicable.
Restrictions on use	For research use only. Not for human or veterinary use, therapeutic use, diagnostic use, food, household, or consumer applications.
Responsible party	Alan Scientific Inc.
U.S. address	9031 Shady Grove Court, Gaithersburg, MD 20877 U.S.
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Section 2 - Hazard(s) Identification

OSHA HCS classification	No product-specific OSHA/GHS classification assigned in this draft based on the public information reviewed; toxicological data may be incomplete.
Signal word	Not assigned in this draft
Hazard statements	No specific GHS hazard statements assigned in this draft. Handle as a research chemical with incomplete toxicological characterization.
Pictograms	None assigned in this draft
Precautionary statements	Avoid breathing dust. Wash thoroughly after handling. Wear suitable gloves and eye protection. Use adequate ventilation.
HNOC	None specifically identified in the information reviewed.
Unknown acute toxicity	Product-specific acute-toxicity data may be unavailable; see Section 11.

Section 3 - Composition / Information on Ingredients

Substance / mixture	Substance
Chemical name	1,7-Bis(tert-butoxycarbonylmethyl)-1,4,7,10-tetraazacyclododecane
CAS No.	162148-48-3
Molecular formula	C ₂₀ H ₄₀ N ₄ O ₄
Molecular weight	400.56 g/mol
Purity / concentration	Product-specific; refer to Certificate of Analysis (COA).
Hazard-contributing impurities	No additional hazard-contributing impurities identified in the information reviewed.

Section 4 - First-Aid Measures

Inhalation: Move to fresh air. Obtain medical attention if symptoms occur or persist. **Skin contact:** Remove contaminated clothing and wash thoroughly with soap and water. **Eye contact:** Rinse cautiously with water for several minutes; remove contact lenses if present and easy to do. Continue rinsing and obtain medical advice if irritation persists. **Ingestion:** Rinse mouth. Do not induce vomiting unless directed by medical personnel. Obtain medical advice if unwell. Treat symptomatically and supportively.

Section 5 - Fire-Fighting Measures

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide as appropriate for the surrounding fire. **Specific hazards:** Carbon oxides and product-dependent nitrogen, sulfur, phosphorus, halogen or other decomposition products may form during combustion or thermal decomposition. **Firefighter protection:** Wear self-contained breathing apparatus and appropriate protective equipment when conditions warrant.

Section 6 - Accidental Release Measures

Avoid dust formation and inhalation. Provide ventilation and use appropriate personal protective equipment. Collect dry material carefully without generating dust and place in a suitable closed container for disposal. Prevent unnecessary release to drains or the environment.

Section 7 - Handling and Storage

Handle using good laboratory practice. Avoid inhalation of dust and unnecessary contact with skin and eyes. Keep container tightly closed and protect from contamination and moisture. Store according to the product label and lot-specific COA/MSDS; use any supplier-recommended refrigerated, frozen, light-protected or inert-atmosphere condition where applicable.

Section 8 - Exposure Controls / Personal Protection

Occupational exposure limits	No substance-specific OSHA PEL or ACGIH TLV identified in the reviewed information.
Engineering controls	Use general laboratory ventilation; local exhaust is appropriate where dust is generated.
Eye / face protection	Safety glasses or suitable chemical splash protection.
Skin / body protection	Suitable chemical-resistant gloves and laboratory clothing.
Respiratory protection	Normally not required under controlled handling; if dust is generated and ventilation is insufficient, use an appropriate NIOSH-approved particulate respirator.
Hygiene measures	Wash hands after handling. Do not eat, drink or smoke in chemical handling areas.

Section 9 - Physical and Chemical Properties

Physical state	Solid (typical research-reagent form; verify lot-specific COA).
Appearance	Solid/powder; lot appearance may vary and should be checked against the COA.
Odor	No validated product-specific value assigned in this draft.
pH	No data available
Melting point	No validated Alan Scientific lot-specific value assigned in this MSDS.
Boiling point / range	No data available
Flammability	No data available
Flash point	No data available
Vapor pressure	No data available
Density / relative density	No data available
Solubility	Product-specific; consult technical data/COA if available.
Partition coefficient	No data available
Molecular weight	400.56 g/mol

Section 10 - Stability and Reactivity

Reactivity: No comprehensive product-specific reactivity data are assigned in this document. **Chemical stability:** Expected to be stable under recommended storage conditions. **Conditions to avoid:** Excessive heat, moisture where relevant, prolonged light exposure where relevant, and conditions inconsistent with the product label. **Incompatible materials:** Strong oxidizing agents and functional-group-specific incompatible reagents unless intentionally used in a controlled synthetic step. **Hazardous decomposition products:** May include carbon oxides and product-dependent nitrogen, sulfur, phosphorus, halogen or other decomposition products.

Section 11 - Toxicological Information

Likely exposure routes	Inhalation of dust, eye contact, skin contact and ingestion.
Acute toxicity	No numerical product-specific LD50/LC50 data assigned in this draft; chemical and toxicological properties may be incompletely characterized.
Skin corrosion / irritation	See Section 2; otherwise no validated product-specific data assigned.
Eye damage / irritation	See Section 2; otherwise no validated product-specific data assigned.
Respiratory / skin sensitization	No validated product-specific sensitization data assigned in this draft unless stated in Section 2.
Germ cell mutagenicity	No data available.
Carcinogenicity	Not identified here as a listed carcinogen by IARC, NTP or OSHA based on currently reviewed information.
Reproductive toxicity	No data available.
STOT - single exposure	See Section 2; otherwise no data available.
STOT - repeated exposure	No data available.
Aspiration hazard	Not applicable to the supplied solid based on available information.
Additional information	Chemical and toxicological properties may not be fully characterized. Handle using good laboratory safety practice.

Section 12 - Ecological Information

No complete product-specific ecotoxicity data are assigned in this document. Persistence, degradability, bioaccumulation and mobility data are limited or unavailable. Avoid unnecessary environmental release.

Section 13 - Disposal Considerations

Dispose of product, residues and contaminated packaging in accordance with applicable federal, state and local requirements. Do not mix with incompatible waste streams. Handle uncleaned containers as product residue.

Section 14 - Transport Information

Transport status	No dangerous-goods classification assigned in this draft; verify shipment-specific supplier, carrier and jurisdictional requirements.
UN number	Not assigned in this draft unless a regulated classification is confirmed.
Proper shipping name	Not assigned.
Hazard class	Not assigned.
Packing group	Not assigned.
Environmental hazards	No transport-specific environmental classification assigned in this draft.
Special precautions	Use secure, closed packaging appropriate for laboratory chemicals and verify carrier requirements before shipment.

Section 15 - Regulatory Information

OSHA HCS	Prepared with consideration of the OSHA Hazard Communication Standard (29 CFR 1910.1200); classification in Section 2 reflects the currently reviewed information and may require revision against the upstream supplier SDS.
Other regulatory considerations	Users and importers are responsible for confirming TSCA, state, local and jurisdiction-specific requirements for the specific transaction and use.

Section 16 - Other Information

Revision	1.0
Date of preparation / revision	2026-09-08
Revision summary	Alan Scientific MSDS prepared for 1,7-Bis(tert-butoxycarbonylmethyl)-1,4,7,10-tetraazacyclododecane (AS4228) within the Newly Launched Small-Molecule Specialties optimization batch using the no-logo 16-section format.
Data / assessment basis	Alan Scientific live product identity plus currently reviewed public chemical/supplier information. This document is a research-use draft; final external release should remain aligned with the lot-specific upstream supplier SDS and COA, especially for hazard, storage and transport classification.

Safety information notice: Information is provided in good faith for safe handling of the supplied research material and is based on information reasonably available as of the revision date. It is not a product specification or warranty. Users are responsible for determining suitability, controls and regulatory obligations for their specific use.