

## MATERIAL SAFETY DATA SHEET

### 1.0 Chemical Product and Company Identification

Common Name: **Sodium iodide/thallium iodide scintillation crystal**  
Chemical Name: Sodium iodide (thallium-doped)  
Formula: NaI(Tl)  
Product CAS No.: 7681-82-5/7790-30-9

**Manufacturer:**

Alpha Spectra, Inc.  
715 Arrowest Ct.  
Grand Junction, CO 81505  
Business Telephone: (970)243-4477 Monday-Friday, 8 AM – 5 PM Mountain Time

**Emergency Telephone Number (INFOTRAC): (800)535-5053**

### 2.0 Composition, Information on Ingredients

Ingredient	%Wt.	CAS Number	OSHA PEL	ACGIH TLV
Sodium Iodide	>99.5%	7681-82-5	None established	None established
Thallium Iodide	<0.5%	7790-30-9	0.1 mg/m <sup>3</sup> , as TI (Skin)	0.1 mg/m <sup>3</sup> , as TI (Skin)

### 3.0 Hazards Identification

Emergency Overview:

Odorless, solid clear crystalline form with yellow tint if exposed to air.

Potential Health Effects

Possible routes of entry:

Inhalation: eyes, skin, inhalation, ingestion, injection.

Skin contact: May cause skin irritation or allergic reaction.

Eye contact: may cause eye irritation.

Ingestion: harmful if swallowed: See Section 11.0 (Toxicological Information).

### 4.0 First-Aid Measures

Inhalation: Should over-exposure symptoms exist, remove to fresh air and seek medical attention.

Eye and Skin contact: If exposed to dust and should over-exposure symptoms exist, immediately flush eyes with plenty of water for at least 15 minutes and wash skin with soap and water.

Ingestion: If large quantities are ingested, seek medical advice.

## 5.0 Fire and Explosion Hazard Data

Flashpoint: Not available  
Autoignition: Not available  
UEL: Not available  
LEL: Not available

Extinguishing media: Use water, carbon dioxide or foam.

Special Fire Fighting Measures: Wear positive-pressure self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: Not a fire or explosion hazard. However, toxic emissions are possible in a fire situation.

## 6.0 Accidental Release Measures

Land Spill: If broken or not useable, scoop up or vacuum into a container for proper disposal in accordance with site-specific spill response procedures and all applicable federal, state and local regulations.

Water Spill: If possible, physically remove solid or particulate, or pump liquid into an appropriate container for proper disposal. Notify applicable authorities in accordance with applicable federal, state and local regulations.

## 7.0 Handling and Storage

Handling: Keep container closed. Avoid contact with eyes and/or skin.

Storage: Keep away from moisture and sunlight. Store at ambient temperature and pressure.

## 8.0 Engineering Controls and Personal Protective Equipment

Engineering Controls: If machining, grinding or cutting material, provide local exhaust ventilation as necessary to control airborne dust exposures. Otherwise, general exhaust ventilation is adequate.

Personal Protection:

Respiratory Protection: Use a NIOSH/MSHA-approved respirator with a HEPA cartridge or equivalent, as necessary. If vapors of NaI(Tl) are at elevated temperatures, follow appropriate guidelines for iodine vapor protection.

Personal Protective Equipment (based on applicable site-specific hazard assessment):

Safety glasses with side shields should be worn if risk of flying objects or dust is present from machining, grinding, polishing, cutting, or from any other source.

Rubber or neoprene gloves as necessary to prevent skin contact.

Body protection as necessary to prevent skin contact, or contact with clothing that could become saturated and expose skin to contact with the chemical.

## 9.0 Physical and Chemical Properties

Form:	Solid crystalline
Color:	Clear with slight yellow tint if exposed to air
Odor:	Odorless
Boiling Point:	1300 °C
Specific Gravity (H <sub>2</sub> O):	3.67
Melting Point:	661 °C
Vapor pressure (mm Hg):	4.0 x 10 <sup>-5</sup> Torr at 427 °C
Vapor Density (air=1)	Not applicable at room temperatures
Evaporation Rate (buty acetate = 1):	Not applicable
% Solubility in water:	Very Soluble
pH:	7-9.5 depending on preparation

## 10.0 Stability and Reactivity

General:

This product is stable and hazardous polymerization is not known or expected to occur.

Incompatibility (materials to avoid): bromine trifluoride, perchloric acid, oxidizers and mineral acids.

Hazardous decomposition products: iodine and hydrogen iodide, and upon contact with oxidizers and mineral acids. Iodine vapors emitted in dangerous quantities when heated to decompositions.

## 11.0 Toxicological Information

This product is not considered by NTP, IARC or OSHA as a suspected or known animal or human carcinogen.

Sodium iodide is moderately toxic by ingestion, intravenous and intraperitoneal routes. Human teratogenic effects by ingestion of sodium iodide include developmental abnormalities of the endocrine system. Human reproductive effects by ingestion include poor birth weight.

Oral-Woman TDLo:	9240 mg/kg (teratogenic and reproductive effects)
Oral-Mouse LD <sub>50</sub> :	1000 mg/kg
Oral-Rat LD <sub>50</sub> :	4340 mg/kg

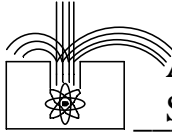
Thallium iodide is a poison by ingestion and subcutaneous routes. Human systemic effects by ingestion include: lowering of blood pressure, change in motor activity and muscle weakness.

Oral-Rat LDLo:	55 mg/kg
----------------	----------

**Note that the small amount of thallium contained in this solid crystal is not expected to represent a health hazard (from thallium) unless large amounts of crystals are ingested or large amounts of dust are inhaled.**

## 12.0 Ecological information

No information available.



**Alpha Spectra, Inc.**  
**Scintillation Detectors**

715 Arrowst Court · Grand Junction, CO 81505

MSDS Preparation Date:  
September 11, 1997

**13.0 Disposal Considerations**

This product is not considered to be a listed or characteristic hazardous waste by USEPA. Dispose of in accordance with applicable federal, state and local regulations.

**14.0 Transportation Information**

USDOT: Not regulated  
ICAO: Not regulated

**15.0 Regulatory Information**

USEPA Waste Classification: Non-hazardous

TSCA Classification: The components of this product are listed on the Toxic Substances Control Act (TSCA) Inventory of chemical substances.

SARA Section 312 Hazard Categories:

Immediate (Acute):	Health Hazard: Yes
Delayed (Chronic):	Health Hazard: No
Fire Hazard:	No
Reactivity Hazard:	No
Sudden Release of Pressure:	No

SARA Section 313 Notification:

This product contains a toxic chemical (or chemicals) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

<u>Chemical Name</u>	<u>CAS Number</u>	<u>%Wt.</u>
Thallium iodide (as TI) (Thallium compounds)	7790-30-9	<0.5%

**16.0 Other Information**

National Fire Protection Association (NFPA) Hazard Classification:

Health: 1      Flammability: 0      Reactivity: 0

Hazardous Materials Identification System (HMIS) Hazard Classification:

Health: 1      Flammability: 0      Reactivity: 0

Information presented herein has been compiled from reputable sources and, to the best of our knowledge, is accurate, reliable and current at the mentioned date. Alpha Spectra, Inc. does not accept any liability arising out of the use of the information provided here or the use, application or processing of the product(s) described herein. Attention of users is drawn to the possible hazards from improper use of the product(s).

Revision 1.0

Prepare by: C. Richard Schwerdtfeger, Ph.D.

Title: Crystal Growth Manager and  
Safety Officer

Preparation Date: September 11, 1997