

1. Chemical Product and Company Identification

Trade Name: NYACOL® SN902PM
Chemical Name: Tin Antimony Cassiterite
Synonyms: Tin Oxide
Product Code: SN902PM
Use: Catalysts, ceramics, and PET
Manufacturer: Nyacol Nano Technologies, Inc.
Megunko Road, P.O. Box 349, Ashland, MA 01721 U.S.A.
508-881-2220
Emergency Telephone: CHEMTREC: 1-800-424-9300
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2. Composition/Information on Ingredients

<u>Component</u>	<u>CAS #</u>	<u>Exposure Limits</u>	<u>Percent By Weight</u>
Tin Antimony Cassiterite:	68187-54-2	2 mg/M ³ as tin	20-40%
Propylene glycol methyl Ether:	107-98-2	100 mg/M ³ TWA	60-80%



<u>Component</u>	<u>EINECS #</u>	<u>RTECS #</u>	<u>REACH #</u>
Tin Antimony Cassiterite:	269-105-9	N/A	05-21 17294628-27-0000
Propylene glycol methyl Ether:	203-539-1	UB7700000	Not listed.

3. Hazard Identification

Emergency Overview: Transparent dark blue liquid. Slight ether-like odor. Harmful. Keep spills out of surface waters.

OSHA Hazards: Flammable liquid, Target Organ Effect, Irritant

Classification: Flammable and combustible material, Harmful

Symbol:  St. Andrew's Cross


Risk Phrases: R10 - Flammable.
R22 - Harmful if swallowed.

Safety Phrases: S2 - Keep out of reach of children.
S9 - Keep container in a well-ventilated place.
S16 - Keep away from sources of ignition - no smoking.
S24 - Avoid contact with skin.
S33 - Take precautionary measures against static discharges.

Potential Health Effects / Health Hazard Identification

Eye: Irritation.

Skin: Prolonged contact may cause skin irritation with local redness. Repeated contact may cause skin irritation with local redness. Prolonged skin contact with very large amounts may cause dizziness or drowsiness. Repeated skin contact may result in absorption of harmful amounts.

Ingestion: May be harmful if swallowed.

Inhalation: Brief exposure (minutes) is not likely to cause adverse effects. The odor is objectionable at 100 ppm; higher levels produce eye, nose and throat irritation and are intolerable at 1000 ppm. Anesthetic effects are seen at or above 1000 ppm. Inhaling Propylene glycol methyl ether can irritate the nose throat and lungs

- causing coughing, wheezing and/or shortness of breath.
- Chronic Exposure: Chronic inhalation of tin oxide dust may induce stannosis, a benign form of pneumoconiosis.
- Effects of Repeated Exposure: Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. In animals, effects have been reported on the following organs: Kidney. Liver.
- Reproductive Hazard: According to information presently available to the New Jersey Department of Health and Senior Services, Propylene glycol methyl ether has been tested and has not shown to affect reproduction. It has been toxic to the fetus in laboratory animals at doses toxic to the mother.
- Other Hazards
- Known Synergists: None known.
- Explosion Hazard: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Flammable mixtures may exist within the vapor space of containers at room temperature. Flammable concentrations of vapor can accumulate at temperatures above flash point. See Section 9. Propylene glycol methyl ether may form explosive peroxides during prolonged storage.
- Fire Hazard: Flammable liquid.
- Combustion Hazard: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.
- Corrosion Hazard: None known.

4. First Aid Measures

- Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of the eye and lids with water. After initial flushing for 1–2 minutes remove contact lenses, if present, and continue flushing for several additional minutes. Get medical attention.
- Skin Contact: Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.
- Ingestion: Give large quantities of water. Consult medical professional. Never give anything by mouth to an unconscious person. Do not induce vomiting unless directed to do so by medical personnel.
- Inhalation: If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.
- First Aid Facilities: Eye wash station.
- Advice to Physicians: Tin oxide (stannic oxide) has a very low order of toxicity. Colloidal tin oxide has been used as a hepatolienographic agent by intra-venous injection in rabbits and dogs without reaction or obvious harm, see The American Journal of Roentgenology, Radium Therapy and Nuclear Medicine, Vol. LXXVII, No. 1, January, 1957, "A New Hepatolienographic Agent: Tin Oxide", Harry W. Fischer, M.D. For a general overview see Toxicological Profile for Tin, U.S. Department of Health and Human Services; PB93-110864.
- Treatment of exposure to Propylene glycol methyl ether should be directed at the control of symptoms and the clinical condition of the patient.

5. Firefighting Measures

- Flammability: Flammable liquid.
- Extinguishing Media: Water fog or fine spray. Dry chemical fire extinguishers. CO₂ fire extinguishers. Foam. Do not use direct water stream. Straight or direct water streams may not be effective to extinguish fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function

but will be less effective.

Protective Equipment: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective firefighting clothing (includes firefighting helmet, coat, trousers, boots and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

Special Exposure Hazard: None known.

6. Accidental Release Measures

Leaks and Spills: Small spills: Absorb with materials such as sand, vermiculite. Collect in suitable and properly labeled containers. Large spills: Contain spilled material if possible. Ground and bond all containers and handling equipment. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Use only non-sparking tools and equipment, especially when opening and closing containers. See Section 13 for additional information.

Personal Protection: Isolate the area. Refer to Section 7. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in the area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. For large spills, warn public of downwind exposure hazard. Check area with combustible gas detector before reentering area. Ground and bond all containers and handling equipment. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Ground and bond all containers and handling equipment. Use appropriate safety equipment. Refer to Section 8, Exposure Controls and Personal Protection.

7. Handling and Storage

Handling: Avoid generating mist or dust during use.

Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Avoid breathing vapor. Use with adequate ventilation. Keep container closed. Never use air pressure for transferring product. No smoking, open flames or sources of ignition in handling and storage area. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Electrically bond and ground all containers and equipment before transfer or use of material. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Use of non-sparking or explosion-proof equipment may be necessary depending upon the type of operation. Keep away from heat, sparks and flame. See Section 8, Exposure Controls and Personal Protection.

This product is a poor conductor of electricity and can become electrostatically charged even in bonded or grounded equipment. If sufficient charge is accumulated, ignition of flammable mixtures can occur. Handling operations that can promote accumulation of static charges include but are not limited to mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operation.

Other Precautions: Spills of these organic materials on hot fibrous insulations may lead to lowering of the auto-ignition temperatures possibly resulting in spontaneous combustion.

Storage: Flammable mixtures may exist within the vapor space of containers at room temperature. Keep container closed. Minimize sources of ignition, such as static build-up, heat, spark, or flame. Store in the following material(s): Carbon steel. Stainless steel. Phenolic lined steel drums. Do not store in: Aluminum. Copper. Galvanized iron. Galvanized steel. Store in cool dry area. Do not freeze.

8. Exposure Controls / Personal Protection

- Engineering Control:** Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.
- Respiratory Protection:** Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects such as respiratory irritation or discomfort have been experienced or where indicated. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. The following should be effective types of air-purifying respirators: Organic vapor cartridge. Dust cartridge.
- Skin Protection:** Workers should use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron or full body suite will depend on task. Hand protection: Use gloves, chemically resistant to this material. Examples of acceptable glove materials include: Butyl, Nitrile and Neoprene. The selection of glove for a particular application and duration of use in a workplace should take into account all relevant workplace factors.
- Eye Protection:** Goggles or face shield recommended to prevent eye contact.
- Ingestion:** Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

9. Physical and Chemical Properties

- Appearance:** Dark blue liquid
- Odor:** Slight ether-like.
- Physical State:** Liquid
- pH:** Not applicable.
- Boiling Point:** 120°C (248°F) (Propylene glycol methyl ether)
- Freezing Point:** 0–97°C (–143°F) (Propylene glycol methyl ether)
- Flash Point:** 31°C (88°F)
- Oxidizing Properties:** Not an oxidizer.
- Solubility in Water:** 100 %
- Density:** 1100 kg/M³
- Specific Gravity:** 1.1
- Volatile by Weight:** 60–80 %
- Viscosity:** 5–10 cP
- Explosion Limits:** Not determined.
- Partition Coefficient:** –0.49 estimated.
- Evaporation Rate:** Not determined.

10. Stability and Reactivity

- Chemical Stability:** Stable.
- Conditions To Avoid:** Do not distill to dryness. Product can oxidize at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.
- Incompatibility With Other Materials:** Substances which may lead to the formation of volatile hydrides or halides of organic tin compounds. Avoid contact with: Strong acids. Strong bases. Strong oxidizers.
- Thermal Decomposition:** Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Aldehydes, ketones, organic acids.

Hazardous Polymerization: Will not occur.

11. Toxicological Information

<u>Material</u>	<u>LD₅₀, Rat, Oral</u>
Tin oxide:	None reported.
Propylene glycol methyl ether:	Greater than 6100 mg/kg. See Section 3: Ingestion.
Eye Effects:	May cause slight temporary eye irritation. Corneal injury is unlikely.
Skin Effects:	Prolonged contact may cause skin irritation with local redness. Repeated contact may cause skin irritation with local redness. LD50, Rabbit, 13,000 mg/kg (Propylene glycol methyl ether).
Inhalation Effects:	LC50, Rat, >6 mg/l (Propylene glycol methyl ether). Published reports claim respiratory irritation from stannic oxide.
Ingestion Effects:	LD50, Rat, 6100 mg/kg (Propylene glycol methyl ether). May be harmful if swallowed.

12. Ecological Information

Ecotoxicity:	Propylene glycol methyl ether is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
Mobility:	Potential for mobility in soil is very high (Koc between 0 and 50). (Propylene glycol methyl ether)
Persistence:	Tin is generally regarded as being relatively immobile in the environment (WHO1980). Propylene glycol methyl ether is readily biodegradable. Propylene glycol methyl ether passes OECD test(s) for ready biodegradability.

13. Disposal Considerations

Disposal Considerations:	The preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.
United States:	Not a RCRA hazardous waste.

14. Transport Information

<u>Regulations</u>	<u>Shipping Name</u>	<u>Hazard Class</u>	<u>Packing Group</u>	<u>U.N. Number</u>
U.S. D.O.T. (Non-Bulk/Bulk):	1-methoxy-2-propanol	3	PG III	UN3092
ICAO / IATA:	1-methoxy-2-propanol	3	PG III	UN3092
Cargo Packing Instruction: 310				
Passenger Packing Instruction: 309				
IMO / IMDG:	1-methoxy-2-propanol	3	PG III	UN3092
EMS Number: F-E,S-D				
ADR:	Not applicable.	Not applicable.	Not applicable.	Not applicable.

15. Regulatory Information

<u>U.S. Federal Regulations</u>	
EPA TSCA Inventory:	All ingredients listed.
OSHA Hazards:	Propylene glycol methyl ether is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
SARA Section 313:	Not subject to reporting.
U.S. D.O.T. Regulations:	See Section 14.

U.S. State Regulations



California Proposition 65: No ingredients listed.
 State Right-to-Know Laws: Section 2 of this MSDS lists all components of SN902PM.

	<u>Chemical Name</u>	<u>CAS #</u>	<u>Revision Date</u>
Massachusetts Right to Know Components	Propylene glycol methyl ether	107-98-2	1994-04-01
Pennsylvania Right to Know Components	Propylene glycol methyl ether	107-98-2	1994-04-01
New Jersey Right to Know Components	Propylene glycol methyl ether	107-98-2	1994-04-01

Canadian Regulations

Domestic Substance List: All ingredients listed.
 WHMIS: B2 (Flammable liquid), D2 (Material causing other toxic effects)
 Transportation of Dangerous Goods: Not applicable. SN902PM does not meet dangerous goods criteria.
 Controlled Products Regulations: This MSDS contains all the information items specified in Schedule 1, Column 3 of the Controlled Products Regulations in a 16-heading format.

EC Regulations

Classification: Flammable and combustible material, Harmful
 Symbol:  St. Andrew's Cross

 Risk Phrases: R10 - Flammable.
 R22 - Harmful if swallowed.
 Safety Phrases: S2 - Keep out of reach of children.
 S9 - Keep container in a well-ventilated place.
 S16 - Keep away from sources of ignition - no smoking.
 S24 - Avoid contact with skin.
 S33 - Take precautionary measures against static discharges.

International Inventory Status

Propylene glycol methyl ether: Australia (AICS); Canada (DSL); Europe (EINECS); Japan (ENCS); Korea (ECL), Philippines (PICCS); Taiwan (CSNN)
 Tin Antimony Cassiterite: Australia (AICS); Canada (DSL); Europe (EINECS); Japan (ENCS); Korea (ECL); Philippines (PICCS); Taiwan (CSNN)

16. Other Information

NFPA 704 Hazard Rating: Health - 2, Flammability - 3, Reactivity - 0, Special - None
 HMIS® Hazard Rating: Health - 2, Flammability - 3, Reactivity - 0
 Protective Equipment - J; splash goggles, gloves, apron, combination respirator
 Recommended Use: Recommended for use as a catalyst, in ceramics and in PET. Other uses have not been investigated and may have other hazards. For industrial use only, not for food, drug or home use.
 Work Alert: Workers using SN902PM should read and understand this MSDS and be trained in the proper use of this material.



MATERIAL SAFETY DATA SHEET
NYACOL® SN902PM

REVISION: 5/30/2013
SUPERSEDES: NONE
PAGE: 7 OF 7

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Revision Date: May 30, 2013

Supersedes: None

This MSDS has been prepared with data from Nyacol Nano Technologies, Inc.'s laboratories, raw material suppliers, and government publications.

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