1. Chemical Product and Company Identification

Trade Name:	NYACOL® SN902
Chemical Name:	Tin Antimony Cassiterite
Synonyms:	Tin Oxide
Product Code:	SN902
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
E-mail Contact:	info@nyacol.com

2. Composition/Information on Ingredients

Component	CAS #	Exposure Limits	Percent By Weight
Tin Antimony Cassiterite:	68187-54-2	2 mg/M³ as tin	20
Ethylene Glycol:	107-21-1	None.	80

Component	EINECS #	RTECS #	REACH #
Tin Antimony Cassiterite:	269-105-9	N/A	05-2117294628-27-0000
Ethylene Glycol:	203-473-3	KW2975000	05-2117294572-36-0000

3. Hazard Identification

Emergency Overview: Transparent dark blue liquid. Harmful. Keep spills out of surface waters.

Classification: Harmful.

Symbol:  n St. Andrew's Cross

Risk Phrases: R22 Harmful if swallowed.

Safety Phrases: S2 Keep out of reach of children.

Potential Health Effects / Health Hazard Identification

Acute Exposure:

Eye: May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye.

Skin: Brief contact may cause slight irritation. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects below and Section 11 for information regarding potential long term effects.

Ingestion: Contains ethylene glycol, which is toxic when swallowed. A lethal dose for an adult is 1-2 ml per kilogram, or about 4 ounces (one-half cup or 120 ml.). Symptoms include headache, weakness, con-fusion, dizziness, staggering, slurred speech, loss of coordination, faintness, nausea and vomiting, increased heart rate, decreased blood pressure, difficulty breathing and seeing, pulmonary edema, unconsciousness, convulsions, collapse, and coma. Symptoms may be delayed. Decreased urine output and kidney failure may also occur. Severe poisoning may cause death. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

Inhalation: Vapors or mist in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headaches, nausea and drowsiness. Prolonged or repeated overexposure may result in the absorbance of potentially harmful amounts of material.

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3. Hazard Identification, continued

Chronic Exposure: Chronic inhalation of stannic oxide causes a benign form of pneumoconiosis known as stannosis. Repeated ingestion of ethylene glycol may cause kidney damage.

Other Hazards

Known Synergists: None known.

Explosion Hazard: None known.

Fire Hazard: This material will burn in a fire.

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. 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: If a person is conscious and can swallow, immediately give two glasses of water (16 oz. or 500 ml.) but do not induce vomiting. If vomiting occurs, give fluids again. Have physician determine if condition of person will permit induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

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: Ethylene glycol poisoning may initially produce behavior changes, drowsiness, vomiting, diarrhea, thirst, and convulsions. End-stage signs of poisoning are renal damage/failure with metabolic acidosis. Immediate treatment, supplemented with hemodialysis if indicated, may limit the progression and severity of toxic effects. Intravenous ethanol in sodium bicarbonate solution is a recognized antidotal treatment; other antidotal treatments also exist for ethylene glycol poisoning. Contact a Poison Center for further treatment information.

Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information.

Tin oxide (stannic oxide) has a very low order of toxicity. Colloidal tin oxide has been used as a hepatolienographic agent by intravenous 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.

5. Firefighting Measures

Flammability: Combustible, material will burn in a fire. Containers can build pressure if exposed to heat or fire.

Extinguishing Media: Use water spray, dry chemical, foam, or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Protective Equipment: Wear standard full firefighter turn-out gear (full bunker gear) and respiratory protection (SCBA).

Special Exposure Hazard: None known.

6. Accidental Release Measures

Leaks and Spills:	Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing. If more than 1 pound of product is spilled, then report spill according to SARA 304 and CERCLA 102(A) requirements.
Personal Protection:	Emergency responders should wear eye protection and impervious gloves. An approved air-purifying respirator should be worn if dust or mist is present. See Section 8.

7. Handling and Storage

Handling:	Avoid generating mist or dust during use. Minimum feasible handling and temperatures should be maintained.
Storage:	Store in cool dry area. Do not freeze. Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. Exposure Controls / Personal Protection

Engineering Control:	Ventilation adequate to meet occupational exposure limits. The OSHA ceiling is 50 ppm; ACGIH ceiling is 50 ppm.
Respiratory Protection:	Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air-supplied respirators should always be worn when airborne concentrations of the contaminant or oxygen content is unknown.
Skin Protection:	Wear clean body-covering clothing and impervious gloves such as neoprene. Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.
Eye Protection:	Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

9. Physical and Chemical Properties

Appearance:	Dark blue liquid.
Odor:	None
Physical State:	Liquid. NYACOL® SN902 is an ethylene glycol-based material.
pH:	Not applicable.
Boiling Point:	195° C
Freezing Point:	-13° C
Flash Point:	None.
Vapor Pressure:	0.05 mm Hg at 20° C.
Oxidizing Properties:	Not an oxidizer.
Solubility in Water:	Not soluble
Density:	1290 kg/M^3
Specific Gravity:	1.29
Volatile by Weight:	80
Viscosity:	20 cP
Explosion Limits:	Not applicable.
Partition Coefficient:	Not available.
Evaporation Rate:	Slow (Butyl Acetate = 1)

10. Stability and Reactivity

Chemical Stability:	Stable.
Conditions To Avoid:	None known.
Incompatibility With Other Materials:	None known.
Hazardous Decomposition Products:	Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning. Heating in air may produce irritating aldehydes, acids, and ketones.
Hazardous Polymerization:	Will not occur.

11. Toxicological Information

Material	LD_{50}, Rat, Oral
Tin Oxide:	>20 gm/kg
Ethylene Glycol:	>4700 mg/kg. See Section 3: Ingestion.

Eye Effects:	(Draize) Believed to be 15.00 - 25.00/110 (rabbit) slightly irritating.
Skin Effects:	(Draize) Believed to be >.50 - 1.00/80 (rabbit) slightly irritating.
Inhalation Effects:	Published reports claim respiratory irritation from stannic oxide.
Ingestion Effects:	See Section 3.

12. Ecological Information

Ecotoxicity:	LC50-96 hr Aquatic toxicity rating for ethylene glycol is believed to be >100.00 mg/liter: practically non-toxic.
Persistence:	The ethylene glycol in this product is reported to have a moderate rate of biodegradation; greater than or equal to 30% degradation over a test period of 28 days or less. Tin is generally regarded as being relatively immobile in the environment (WHO1980).

13. Disposal Considerations

Disposal Considerations:	SN902 should be recycled or solidified for disposal in a landfill.
United States:	Not a regulated waste.

14. Transport Information

Regulations	Shipping Name	Hazard Class	Packing Group	U.N. Number
U.S. D.O.T.:	Not applicable.	Not applicable.	Not applicable.	Not applicable.
ICAO / IATA:	Not applicable.	Not applicable.	Not applicable.	Not applicable.
IMO / IMDG:	Not applicable.	Not applicable.	Not applicable.	Not applicable.
ADR:	Not applicable.	Not applicable.	Not applicable.	Not applicable.

15. Regulatory Information

U.S. Federal Regulations

EPA TSCA Inventory: All ingredients listed.

SARA Section 313:
Ethylene glycol 80% by weight
Antimony Oxide 1-2% by weight

and CERCLA 102 (A):

Chemical Name	CAS RN	Percent By Weight
Ethylene Glycol	107-21-1	80

If more than one (1) pound of Ethylene Glycol (1.4 pounds of SN902) is spilled, then report the spill according to SARA 304 and CERCLA 102 requirements.

D.O.T. Regulations: See Section 14.

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15. Regulatory Information, continued

U.S. State Regulations

California Proposition 65:	No ingredients listed.
State Right-to-Know Laws:	Section 2 of this MSDS lists all components of SN902.

Canadian Regulations

Domestic Substance List:	All ingredients listed.
WHMIS:	Class D-2A. Material causing other toxic effects.
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.
Transportation of Dangerous Goods:	Not applicable, SN902 does not meet dangerous goods criteria.

EC Regulations

Classification:	Harmful.
Symbol:	 n St. Andrew's Cross
Risk Phrases:	R22 Harmful if swallowed.
Safety Phrases:	S2 Keep out of reach of children.

16. Other Information

NFPA 704 Hazard Rating:	Health - 2, Flammability - 1, Reactivity - 0, Special - None
HMIS® Hazard Rating:	Health - 2, Flammability - 1, Reactivity - 0 Protective Equipment - E; safety glasses, gloves, dust 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 SN902 should read and understand this MSDS and be trained in the proper use of this material.
MSDS Prepared By:	Robert J. Nehring, Jr. Nyacol Nano Technologies, Inc. Telephone: 508-881-2220 (U.S.A.)
Revision Date:	December 16, 2010
Supersedes:	July 29, 2009

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

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