Section 1: Product and Company Identification:

1.1 Product Identifier

Product Form:	Mixture
Identification of Substance:	Tin Antimony Gray Cassiterite
Product Name:	NYACOL® SN902
Synonym:	Antimony tin oxide, tin antimony oxide
CAS Number:	68187-54-2, 107-21-1
Index Number:	Not available.
EINECS Number:	269-105-9, 203-473-3
REACH Registration Number:	01-2119456816-28-0202; See Section 3.
Nanoforms:	Tin antimony gray cassiterite has not specifically been cited as being a potential nanomaterial by ECHA.
Formula:	Sb_xSnO_2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use:	Catalyst. Ceramics. PET.
Restrictions on Use:	For industrial use only, not for food, drug or home use.

1.3 Details of the supplier of the safety data sheet

Company Identification:	Nyacol Nano Technologies, Incorporated Megunko Road, P.O. Box 349, Ashland, MA 01721 U.S.A. +1 508-881-2220
Email Contact:	info@nyacol.com
Internet:	www.nyacol.com

1.4 Emergency telephone number

In Case of Emergency:	USA/Canada CHEMTREC: +1 (703) 527-3887 International CHEMTREC: +1 (703) 741-5970 24 Hours/Day: 7 Days/Week

Section 2: Hazard(s) Identification

2.1 GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute Tox. 4 H302 Harmful if swallowed; STOT, RE 2 H373 May cause damage to organs through prolonged or repeated exposure.

2.1.1 Classification according to Regulation (EC) No. 1272/2008 (CLP)

Acute Tox. 4 H302 Harmful if swallowed; STOT, RE 2 H373 May cause damage to organs through prolonged or repeated exposure.

2.2 Label Elements - Labelling according to Regulation (EC) No. 1272/2008

Signal Word: Warning

Hazard determining components of labelling:	Ethylene Glycol (Ethane-1,2-diol)
Hazard Statement(s):	H302 - Harmful if swallowed. H373 - May cause damage to organs (kidneys) through prolonged or repeated exposure.
Precautionary Statement(s):	P260 - Do not breathe dust/fumes/gas/mist/vapors/ spray. P264 - Wash skin thoroughly after handling. P270 - Do not eat, drink or smoke when using this product. P301+P312+P330 - IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth. P314 - Get medical advice/attention if you feel unwell. P501 - Dispose of contents/container to an approved waste disposal plant.

2.3 Other Hazards

Components do not meet the criteria for a PBT or vPvB substance.

2.4 Unknown acute toxicity (GHS US)

No further relevant information available.

Section 3: Composition / Information on Ingredients

3.1 Chemical characterization: Mixtures

Description: Mixture consisting of the following components.

Hazardous Component Name:	Product Identifier	GHS Classification	Percent By Weight	SCL, M-factor, ATE
Ethylene Glycol: REACH: 01-2119456816-28-0202	CAS: 107-21-1 EINECS: 203-473-3 Index: 603-027-001	Acute Tox. 4, H302 STOT RE 2; H373	80	
Non-hazardous Component Name:	**Product Identifier**	**GHS Classification**	**Percent By Weight**	**SCL, M-factor, ATE**
Tin Antimony Gray Cassiterite:	CAS: 68187-54-2 EINECS: 269-105-9 Index: Not available	Not classified	20	

Impurities: Present at a level below that to be taken into account for classification.

Stabilizing Additives: None

The supplier currently has no knowledge on additional ingredients that are classified and that contribute to the classification of this substance.

See Section 16 for a list of hazards if identified above.

Nanoform characteristics: Tin antimony gray cassiterite has not specifically been cited as being a potential nanomaterial by ECHA.

Section 4: First-Aid Measures

4.1 Description of 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. Do not allow victim to rub eyes or keep eyes closed. 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.

Inhalation: Remove person from exposure source. Get medical attention immediately. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen.

Ingestion: Do NOT induce vomiting. If a person is conscious and can swallow, immediately give two glasses of water (16 oz. or 500 ml.); however, stop if person feels sick as vomiting should be avoided. If vomiting occurs, avoid vomit entering the lungs. 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.

First Aid Facilities: Eye wash station.

4.2 Most important symptoms and effects, both acute and delayed

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 sever 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 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.E61.

4.3 Indication of any immediate medical attention and special treatment needed.

Treat symptomatically. Fomepizole and ethanol are antidotes against ethylene glycol toxicity. See http://www.cdc.gov/niosh/ershdb/EmergencyResponseCard_29750031.html for more detailed advice.

Section 5: Fire-Fighting Measures

5.1 Extinguishing Media

Suitable Extinguishing Media:	Use water, dry chemical, chemical foam, or alcohol-resistant foam. Water or foam may cause frothing. Use agent most appropriate to extinguish fire.
Unsuitable extinguishing media:	None known.

5.2 Special hazards arising from the substance or mixture

Flammability of the product:	Combustible. Material will burn in a fire. Containers can build pressure if exposed to heat or fire.
Special Hazard Arising from the Chemical:	No further relevant information available.
Fire Hazard:	No further relevant information available.
Explosion Hazard	No further relevant information available.
Reactivity:	No further relevant information available.

5.3 Advice for firefighters

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

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions and PPE:	Eye protection and impervious gloves. An approved air-purifying respirator should be worn if vapor or mist is present.

6.1.1 For non-emergency personnel

	Wear protective equipment. Keep unprotected persons away. Avoid inhalation of fumes, contact with skin and eyes.

6.2 Environmental precautions

Do not allow product to reach sewage system or water bodies. Such contamination must be report to local health authority or other responsible authorities.

6.3 Methods and material for containment and cleaning up

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.

6.4 Reference to other sections

For more information on exposure controls and personal protection or disposal considerations, check section 8 and 13 of this SDS.

Section 7: Handling and Storage

7.1 Precautions for safe handling

Avoid generating mist or dust during use. Minimum feasible handling and temperatures should be maintained.

7.1.1 Protective measures

Use only in well ventilated areas. As a precautionary measure, the wearing of standard work gear is suggested. An approved air-purifying respirator should be worn if dust or mist is present. Keep ignition sources away. Do not smoke.

7.1.2 Advice on general occupational hygiene

Avoid inhalation or ingestion. General occupational hygiene measures are required to ensure a safe handling of the substance. These measures involve good personal and housekeeping practices (i.e. regular cleaning with suitable cleaning devices), no eating, drinking and smoking at the workplace and wearing standard working clothes and shoes unless otherwise stated. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas. Shower and change clothes at end of work shift. Do not wear contaminated clothing at home.

7.2 Conditions for safe storage, including any incompatibilities

Provide sufficient ventilation at store and workrooms. Store in cool, dry area. Do not freeze. Periods of exposure to high temperatures should be minimized. Water contaminations should be avoided.

7.3 Specific end use(s)

No further relevant information available.

Section 8: Exposure Controls / Personal Protection

8.1 Control Parameters

Ethylene Glycol, CAS #107-21-1

USA OSHA	OSHA PEL Ceiling (mg/m^3)	Not established
USA ACGIH	TLV Ceiling (aerosol only)	100 mg/m3

Tin Antimony Gray Cassiterite, CAS #68187-54-2

USA OSHA	OSHA PEL Ceiling (mg/m^3)	2 mg/m^3 as tin for tin oxide
USA OSHA	OSHA PEL Ceiling (mg/m^3)	0.5 mg/m^3 as tin for antimony oxide

8.1.2 DNELs and PNECs

Ethylene Glycol (107-21-1)

DNEL (Derived No Effect Level)

Exposure Route	Exposure Pattern	DNEL
Inhalation	Long term systemic	As no long term systemic toxicity hazard has been identified, there is no requirement to derive long term DNELs

	Acute systemic	As no acute toxicity hazard has been identified, there is no requirement to derive acute DNELs
	Long term local	35 mg/m^3 (workers) 7 mg/m^3 (general population)
Dermal	Long term systemic	106 mg/kg bw/day (workers) 53/mg/kg bw/day (general population)
	Acute systemic	As no acute toxicity hazard has been identified, there is no requirement to derive acute DNELs
	Local	As no local toxicity hazard has been identified, there is no requirement to derive local DNELs

PNEC (Predicted No Effect Concentration)

PNEC	Value
Aqua (freshwater)	10 mg/L
Aqua (marine water)	1 mg/L
STP	199.5 mg/L
Sediment (freshwater)	37 mg/kg sediment dw
Sediment (marine water)	3.7 mg/kg sediment dw
Soil	1.53 mg/kg soil dw
Secondary poisoning	No potential for bioaccumulation

8.2 Exposure Controls

Engineering Controls: Ventilation adequate to meet occupational exposure limits.

Hygiene Measures: Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory: 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.

Hands: Wear impervious gloves such as neoprene.

Eyes: Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin: Wear clean body-covering clothing; 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.

8.2.3 Environmental Exposure Controls

Adverse effects of this material on the environment have not been evaluated. Proper disposal techniques to isolate and recover material should be implemented.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Physical State	Liquid
Color:	Dark blue
Odor:	Slightly sweet
Metling point/freezing point:	Not determined
Boiling point:	198° C (388° F) (Ethylene Glycol)
Flammability:	Combustible. Material will burn in a fire.
Lower and upper explosion limit:	Not determined
Flash point:	111 °C (232°F) (Ethylene Glycol)
Auto-ignition temperature:	398 °C (748°F) (Ethylene Glycol)
Decomposition temperature:	Not determined
pH:	Not applicable
Kinematic viscosity, mm^2/s	<50
Solubility:	Fully miscible with water
Partition coefficient, n-octanol/water (log value)	Not determined
Vapor pressure	0.21 hPa at 25 °C (Ethylene Glycol)
Relative density (specific gravity)	1.2
Relative vapor density	Not determined

9.2 Other information

No further relevant information available.

Section 10: Stability and Reactivity

10.1 Reactivity

No further relevant information available.

10.2 Chemical Stability

Stable.

10.3 Possibility of hazardous reactions

No further relevant information available.

10.4 Conditions to avoid

No further relevant information available.

10.5 Incompatible materials

No further relevant information available.

10.6 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, ketones.

Section 11: Toxicological Information

11.1 Information on toxicological effects

Tin Oxide

Acute toxicity (oral)	LD50 >20 gm/kg

Antimony Oxide

Acute toxicity (oral)	LD50 >4000 mg/kg

Ethylene Glycol, CAS 107-21-1

Acute toxicity, oral (human)	LD50: 1400-1600 mg/kg
Acute toxicity, oral (rat)	LD50: >4000 mg/kg
Acute toxicity, dermal (rabbit)	LD50: >6000 mg/kg
Skin corrosion/irritation	Not irritating
Serious eye	Not irritating

Respiratory or skin sensitization	Not sensitizing
Germ cell mutagenicity	Not considered to be mutagenic (weight of evidence approach)
Carcinogenicity	Not considered to be carcinogenic (weight of evidence approach)
Reproductive toxicity	Not considered to be reproductive or developmental toxicant (weight of evidence approach)
STOT-single exposure	Not considered to induce specific organ toxicity after single exposure
STOT-repeated exposure	NOEL 150 mg/kg bw/day – kidneys found to be the target organ at high doses (oral)
Aspiration hazard	Not considered to cause an aspiration hazard
Inhalation:	Not determined. Use breathing protection when aerosol or mist is formed.
Ingestion:	Systemic toxicity can occur through ethylene glycol ingestion. Symptoms include headache, weakness, confusion, 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.

Section 12: Ecological Information

12.1 Toxicity

Ethylene Glycol, CAS 107-21-1

Toxicological endpoint	**Value**	**Species, Method**
Acute (short-term toxicity):		
Fish	LC50 (96h) > 72860 mg/L	Pimephales promelas, EPA 600/4-90/027
Crustacea	EC50 (48h) > 100 mg/L	Daphnia magna, OECD 202
Algae/aquatic plants	EC10 (96h) > 100 mg/L	Weight of evidence approach
Activated sludge respiration	EC20 > 1995 mg/L	Read across approach from supporting substance, ISO 8192
Chronic (long-term toxicity):		
Fish	NOEC (7d) 15380 mg/L	Weight of evidence approach
Crustacea	NOEC (7d) 8590 mg/L	Weight of evidence approach

12.2 Persistence and degradability

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 (WHO 1980).

12.3 Bioaccumulative potential

Ethylene Glycol is not considered to be bioaccumulative.

12.4 Mobility in soil

Tin is generally regarded as being relatively immobile in the environment (WHO 1980).
Ethylene Glycol: Based upon a calculated log Koc (=0), adsorption to solid soil phase is not expected.

Ecotoxical effects:

No further relevant information available.

12.5 Results of PBT and vPvB Assessment

Not available.

12.6 Endocrine disrupting properties

No further relevant information available.

12.7 Other adverse effects

No further relevant information available.

Section 13: Disposal Considerations

This information presented only applies to the materials as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

Disposal Considerations:	The product should be recycled or solidified for disposal in an approved landfill.
United States:	The product is not a RCRA regulated waste.

Section 14: Transport Information

Sections 14.1 - 14.4

Regulations

U.S. D.O.T.: Not regulated.

ICAO/IATA: Not regulated.

IMO/IMDG: Not regulated in non-bulk quantities (<5000 lbs.).

ADR: Not regulated.

RID: Not regulated.

14.5 Environmental hazards:

No further relevant information available.

14.6 Special precautions for users:

No further relevant information available.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable.

Section 15: Regulatory Information

15. 1 Safety, health and environmental regulations/legislation specific for substance or mixture:

Technical Instructions (air):	Class: NK Share in %: 80
Water hazard class:	Water hazard class 1: slightly hazardous for water.
EPA TSCA Inventory:	All ingredients listed.
State Right-to-Know Laws:	Section 3 of this SDS lists all components of the product.
SARA Section 311/312 (40 CFR 370) Hazard:	Acute Toxicity. Specific target organ toxicity, repeated exposure.
SARA Section 313:	Ethylene Glycol 80% by weight. Antimony Oxide 1-2% by weight.
SARA 304 and CERCLA 102 (A):	Chemical Name CAS # Percent By Weight Ethylene Glycol 107-21-1 80 If more than one (1) pound of Ethylene Glycol (1.4 pounds of the product is spilled, then report the spill according to SARA 304 CERCLA 102 requirements.

FDA:	The product is approved by the FDA for use as a heating enhancer in authorized PET polymers in contact with all types of food including infant formula and breast milk for use at levels of up to 0.05 wt% of the polymer. Listed under FCN 001437 with CAS No. 12673-86-8.
California Proposition 65:	Ethylene Glycol is listed for reproductive toxicity.

Canadian Regulations:

Domestic Substance List:	All ingredients listed.
WHMIS:	Class D-2A. Material causing other toxic effects.
Controlled Products Regulations:	This SDS contains all the information items specified in Schedule 1, Column 3 of the Controlled Products Regulations in a 16-heading format.

15. 2 Chemical safety assessment:

A Chemical Safety Assessment has not been carried out.

Section 16: Other Information

List of hazard phrases:
H302 - Harmful if swallowed.
H373 - May cause damage to organs (kidneys) through prolonged or repeated exposure.

National Fire Protection Association (U.S.A.) 704	Health-2, Flammability-1, Reactivity-0, Special-None
HMIS® Hazard Rating:	Health-2, Flammability-1, Reactivity-0, Protective Equipment - E; safety glasses, dust respirator.
Recommended Use:	The product is recommended for use as a catalyst, in ceramics and 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 the productd should read and understand this SDS and be trained in the proper use of this material.
Other Special Considerations:	None known.
SDS Prepared By:	Andrew Guzelian Nyacol Nano Technologies, Incorporated Telephone: 508-881-2220 U.S.A.
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Supersedes:	February 22, 2021

This SDS has been prepared with data from Nyacol Nano Technologies, Inc.'s laboratories, raw material suppliers, and government publications. Information herein is accurate to the best of our knowledge. Suggestions are made without warranty or guarantee of results. Before using, the user should determine the suitability of the products for the intended use, and the user assumes the risk and liability in connection therewith. We do not suggest violation of any existing patents or give permission to practice any patented invention without license.