

421A

# Safety Data Sheet

## Section 1: Identification

### Product Identifier and Other Means of Identification

**Product Name:** 421A**Other Means of Identification:** Liquid Tin**Related Part #** 421A-125ML, 421A-500ML

### Recommended Use and Restriction on Use

**Use:** Electroless tin plating solution**Uses Advised Against:** Not available

### Details of Manufacturer or Importer

**Manufacturer**

MG Chemicals  
1210 Corporate Drive  
Burlington, Ontario L7L 5R6  
CANADA

**TEL** +1-800-340-0772**FAX** +1-800-340-0773**E-MAIL** [support@mgchemicals.com](mailto:support@mgchemicals.com)**WEB** [www.mgchemicals.com](http://www.mgchemicals.com)**E-MAIL** (Competent Person): [sds@mgchemicals.com](mailto:sds@mgchemicals.com)

### Emergency Phone Number

**For hazardous material incidents ONLY** (leaks, spills, fires, exposures or accidents)  
USA or CANADA—Call Verisk 3E at **+1-866-519-4752** or **+1-760-476-3962**  
(Service access code: 335388)

**For emergencies involving the transport of dangerous goods;** 24/7 service  
CANADA—Call CANUTEC collect at **+1-613-996-6666** or **\*666** on cellular phones

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### Section 2: Hazards Identification

#### Classification of Hazardous Chemical

#### GHS Categories

Criteria	Category	Signal Word	Pictograms
Eye Damage	1	Danger	Corrosion
Skin Corrosion	1	Danger	Corrosion
Reproductive Toxicity	2	Warning	Health
Carcinogenicity	2	Warning	Health
Sensitization	Skin	1	Warning
Hazardous to the Aquatic Environment	Chronic	3	none

*Note:* The degree of severity is ranked within each hazard class from 1 (Highest Severity) to up to 5 (Lowest Severity), which is opposite to HMIS and NFPA conventions. Severity category rankings do not allow comparisons between classes.

#### Label Elements

<b>Signal Word</b>	<b>DANGER</b>
<b>Pictograms</b>	<b>Hazard Statements</b>
	H314: Causes severe skin burns and eye damage
	H361: Suspected of damaging fertility or the unborn child if swallowed H351: Suspected of causing cancer if swallowed
	H317: May cause an allergic skin reaction

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<b>Pictograms</b>	<b>Hazard Statements</b>
<i>No symbol mandatory</i>	H412: Harmful to aquatic life with long lasting effects
<b>Prevention</b>	<b>Precautionary Statements</b>
P102	Keep out of reach of children.
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe vapor, spray, and mists.
P280	Wear protective gloves, protective clothing, and eye protection.
P264	Wash hands thoroughly after handling.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
<b>Response</b>	<b>Precautionary Statements</b>
P310	For all routes of exposure: Immediately call a POISION CENTER or doctor.
P308 + P313	IF exposed or concerned: Get medical advice or attention.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P303 + P361 + 352	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Wash with plenty of water or shower.
P333 + P313	If skin irritation or rash occurs: Get medical advice or attention.
P363	Wash contaminated clothing before reuse.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P304 + P340	IF INHALED: Remove person to fresh air keep comfortable for breathing.
<b>Storage</b>	<b>Precautionary Statements</b>
P405	Store locked up.

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Disposal	Precautionary Statements
P501	Dispose of contents in accordance to local, regional, national, and international regulations.

### Hazards Not Otherwise Specified

Other Criteria	Hazard Statements/Precautionary Statement	Signal Word	Pictograms
None	None	None	None

### Section 3: Composition/Information on Ingredients

CAS #	Chemical Name	%(weight)
62-56-6	thiourea	10%
53408-94-9	tin(II) methanesulphonate	5%
75-75-2	methanesulphonic acid	4%

Note: aqueous solution

### Section 4: First-Aid Measures

<i>Exposure Condition</i>	<i>GHS Code/Symptoms/Precautionary Statements</i>
<b>IF IN EYES</b>	P305 + P351 + P338, P310
<b>Immediate Symptoms</b>	<i>redness, pain, severe irritation, burns</i>
<b>Response</b>	Rinse cautiously with water for at least 30 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTRE or doctor.
<b>IF ON SKIN (or hair)</b>	P303 + P361 + P352, P310, P333 + P317, P363
<b>Immediate Symptoms</b>	<i>redness, rash, serious irritation, burns, pain, blisters</i>
<b>Response</b>	Take off immediately contaminated clothing. Wash with plenty of water or shower. Immediately call a POISON CENTRE or doctor.  If skin irritation or rash occurs: Get medical attention.  Wash contaminated clothing before reuse.

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<b>IF INHALED</b>	P304 + P340, P310, P333 + P313
<b>Immediate Symptoms</b>	<i>cough, irritation of the respiratory track, burning sensation in throat, nose and chest</i>
<b>Response</b>	Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTRE or doctor. If exposed or concerned: Get medical attention.
<b>IF SWALLOWED</b>	P301 + P330 + P331, P310, P308 + P313
<b>Immediate Symptoms</b>	<i>burns and burning sensation in mouth, throat, esophagus and stomach</i>
<b>Response</b>	Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTRE or doctor. If exposed or concerned: Get medical attention.

**Section 5: Fire Fighting Measures**

<b>Extinguishing Media</b>	In case of fire: Use extinguish media suitable for surrounding.
<b>Specific Hazards</b>	Will not burn. In a fire, this product can release toxic fumes and gases.
<b>Combustion Products</b>	Produces CO and CO <sub>2</sub> , nitrogen, tin oxides (SnO <sub>x</sub> ), sulfur oxides (SO <sub>x</sub> )
<b>Fire-Fighter</b>	Wear self-contained breathing apparatus and full fire-fighting turn-out gear.

**421A****Section 6: Accidental Release Measures**

<b>Personal Protection</b>	Use personal protection recommended in Section 8.
<b>Precautions for Response</b>	Do not breathe mist, spray, vapors. Ensure adequate ventilation. Remove all sources of extreme heat.
<b>Environmental Precautions</b>	Prevent spill from entering drains and waterways.
<b>Containment Methods</b>	Contain with inert absorbent (such as soil, sand, vermiculite).
<b>Cleaning Methods</b>	Sprinkle inert absorbent compound (sand, diatomite, acid binders, universal binders) onto spill, then sweep into a corrosion resistant (plastic) waste container. Wash spill area with soap and water to remove the last traces of residue.
<b>Disposal Methods</b>	Dispose of spill waste according to Section 13.

**Section 7: Handling and Storage**

<b>Prevention</b>	Keep out of reach of children.  Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.  Do not get in eye, on skin, or on clothing.  Do not breathe vapor, spray, and mists.  Contaminated work clothing should not be allowed out of the workplace.
<b>Handling</b>	Wear protective gloves, protective clothing, and eye protection. Take off immediately all contaminated clothing and wash them before reuse.  Wash hands thoroughly after handling.
<b>Storage</b>	Store locked up.  DO NOT FREEZE. Store in a clean and dry area between 5 to 35 °C.

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**Section 8: Exposure Controls/Personal Protection**
**Substances with Occupational Exposure Limit Values**

Chemical Name	Country	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
tin and its inorganic compounds:	ACGIH	2 mg/m <sup>3</sup>	Not established
	U.S.A. OSHA PEL	2 mg/m <sup>3</sup>	Not established
	Canada AB	2 mg/m <sup>3</sup>	Not established
	Canada BC	2 mg/m <sup>3</sup>	Not established
	Canada ON	2 mg/m <sup>3</sup>	Not established
	Canada QC	2 mg/m <sup>3</sup>	Not established

*Note:* Ingredients are listed in descending weight contribution order (from greatest to least). The ACGIH<sup>1</sup>, OSHA (Table Z-1), and Canadian provinces exposure limits were consulted. Limits from the suppliers' SDS were also consulted. Short term exposure limits (STEL) are for 15 min and long term permissible exposure limits (PEL) for 8 h.

**Engineering Controls**

**Ventilation** Keep airborne concentrations below occupational exposure limits (OEL).

**Personal Protective Equipment**

**Eye protection** Wear appropriate protective eyeglasses or chemical safety goggles.

**RECOMMENDATION:** Ensure that glasses have side shields for lateral protection.

**Skin Protection** For likely contacts, use of protective gloves in butyl rubber, chloroprene, latex, or other chemically resistant gloves with a minimum thickness of 0.6 mm.

For incidental contacts, use disposable nitrile with a minimum thickness  $\geq$  0.1 mm, or other chemically resistant gloves.

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**Respiratory Protection** For over-exposures up to 10 x OEL of mist, vapors, and spray; wear respirator such as a half-mask respirator with organic vapor cartridges.

**RECOMMENDATION:** Consult your local safety supply store to ensure that your respirator has a NIOSH (U.S.) approved filter cartridges appropriate for the ingredients listed in Section 3. The respirator should be fitted to the employee by a professional. Ensure vapor cartridges are stored in sealed plastic bags when not being used.

### General Hygiene Considerations

Wash hands thoroughly with water and soap after handling.

### Section 9: Physical and Chemical Properties

<b>Physical State</b>	Liquid	<b>Lower Flammability Limit</b>	Not available
<b>Appearance</b>	Yellow	<b>Upper Flammability Limit</b>	Not available
<b>Odor</b>	Slight sulfur	<b>Vapor Pressure @20 °C</b>	Not available
<b>Odor Threshold</b>	Not available	<b>Vapor Density</b>	Not available
<b>pH</b>	<1	<b>Relative Density @25 °C</b>	1.25
<b>Freezing/Melting Point</b>	Not available	<b>Solubility in Water</b>	Completely Soluble
<b>Initial Boiling Point</b>	Not available	<b>Partition Coefficient octanol/water</b>	Not available
<b>Flash Point</b>	Not available	<b>Auto-ignition Temperature</b>	Not available
<b>Evaporation Rate</b>	Not available	<b>Decomposition Temperature</b>	Not available
<b>Flammability</b>	Non Flammable	<b>Viscosity @40 °C</b>	<20.5 mm <sup>2</sup> /s

**421A****Section 10: Stability and Reactivity**

<b>Reactivity</b>	Not applicable
<b>Chemical Stability</b>	Chemically stable at normal temperatures and pressures
<b>Conditions to Avoid</b>	Avoid aerosolization and incompatible substances.
<b>Incompatibilities</b>	Avoid strong acids, bases, oxidizers and cyanides.
<b>Polymerization</b>	Will not occur
<b>Decomposition</b>	Will not decompose under normal conditions. For thermal decomposition, see combustion products in Section 5.

**Section 11: Toxicological Information****Summary of Effects and Symptoms by Routes of Exposure**

<b>Eyes</b>	Cause redness, pain, severe irritation, or burns. The symptoms may be delayed.
<b>Skin</b>	May causes redness, rash, pain, blisters, serious irritation, or burns. The symptoms may be delayed.
<b>Inhalation</b>	May cause cough, upper respiratory tract irritation, burning sensations (nose, throat, and lung).
<b>Ingestion</b>	May cause burns and burning sensation in mouth, throat, esophagus and stomach.
<b>Chronic</b>	Prolonged and repeated exposure may lead to skin sensitization. Ingestion or inhalation may have reproductive, developmental, and carcinogenic effects.

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### Acute Toxicity (Lethal Exposure Concentrations)

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation
thiourea	>2 000 mg/kg Rat	2 800 mg/kg Rabbit	195 mg/L 4 h Rat
tin(II) methanesulphonate	1 621 mg/kg Rat	>2 000 mg/kg Rat	Not available
methanesulphonic acid	>860 mg/kg Rat	>1 000 mg/kg Rabbit	>2 mg/m <sup>3</sup> 1 h Mouse
Mixture ATE	>5 000 mg/kg	>5 000 mg/kg	>20 mg/L

*Note:* Toxicity data from the ECHA database were consulted. The data from supplier SDSs were also consulted.

### Other Toxicological Effects

<b>Skin corrosion/irritation</b>	Causes severe skin burns.
<b>Serious eye damage/irritation</b>	Causes serious eye damage.
<b>Sensitization</b> (allergic reactions)	Tin(II) methanesulphonate is a known skin sensitizer.
<b>Carcinogenicity</b> (risk of cancer)	Thiourea is classified as a possible carcinogen based on animal studies and North American regulatory guidelines.  <b>Thiourea [CAS# 62-56-6]</b> IARC Group 2B: Possibly carcinogenic to humans ACGIH A3: Confirmed Animal Carcinogen with Unknown Relevance to Humans CA Prop 65: Listed as Carcinogen NTP: Reasonably anticipated to be a human carcinogen
<b>Mutagenicity</b> (risk of heritable genetic effects)	Based on available data, the classification criteria are not met.
<b>Reproductive Toxicity</b> (risk to sex functions)	Thiourea is believed to decrease fertility in males and females based on animal studies.
<b>Teratogenicity</b> (risk of fetus malformation)	Thiourea may present developmental hazard based on animal studies.

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<b>STOT-single exposure</b>	Based on available data, the classification criteria are not met.
<b>STOT-repeated exposure</b>	Based on available data, the classification criteria are not met.
<b>Aspiration hazard</b>	Based on available data, the classification criteria are not met. This product doesn't contain any Cat 1 ingredients.

### Section 12: Ecological Information

Ecological classifications are based on the IMDG/GHS criteria in conjunction with ecotoxicological data from our suppliers, the European Chemical Agency database (<http://echa.europa.eu>), and other reliable sources.

Thiourea is an acute category 2 environmental toxicant. It is rapidly biodegradable with minimal LC50 of 10 mg/L 96 h for *Danio rerio* (zebra fish); EC50 of  $\geq 5.6$  mg/L 48 h *Daphnia magna* (water flea); EC50 of 6.8 mg/L 96 h *Desmodesmus subspicatus* (green algae).

Tin(II) methanesulphonate is a chronic category 2 environmental toxicant.

Based on available data, methanesulphonic acid is not classified as an environmental hazard according to GHS criteria.

#### Acute Ecotoxicity

See the chronic section.

#### Chronic Ecotoxicity

Category 3

Harmful to aquatic life with long lasting effects

Avoid release to the environment.

#### Biodegradability

Not available

#### Other Effects

Not available

### Section 13: Disposal Considerations

Dispose of contents in accordance with all local, regional, national, and international regulations.

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### Section 14: Transport Information

#### Ground

**Refer to TDG regulations** (Canadian Transportation of Dangerous Goods regulations);  
**USA DOT 49 CFR** (Parts 100 to 185) **Regulations.**

Sizes 1 L and under  
421A-125ML, 421A-500ML  
**Limited Quantity**



**Temperature sensitive—Keep between 5 °C and 35 °C.**

#### Air

**Refer to ICAO-IATA Dangerous Goods Regulations.**

Sizes 0.5 L and under  
421A-125ML, 421A-500ML  
**Limited Quantity**  
Max. Net Qty/Pkg  
0.5 L



Packing Instr. Y840

Sizes greater than 0.5 to 1 L

*FOR REFERENCE ONLY*

**UN number:** UN1760

**Shipping Name:**

Corrosive Liquid, N.O.S. (tin(II)  
methanesulphonate, methanesulphonic acid)

**Class:** 8

**Packing Group:** II

**Marine Pollutant:** No

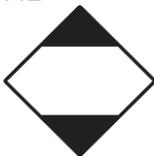
Packing Instr. 851 (Max Net Qty: 1 L).

**Note: Do NOT ship cargo since the product will freeze and be damaged below 0°C.**

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**421A****Sea****Refer to IMDG regulations.**

Sizes 1 L and under  
421A-125ML, 421A-500ML  
**Limited Quantity**



Sizes greater than 1 L

*FOR REFERENCE ONLY*

**UN number:** UN1760

**Shipping Name:**

Corrosive Liquid, N.O.S. (tin(II)  
methanesulphonate, methanesulphonic acid)

**Class:** 8

**Packing Group:** II

**Marine Pollutant:** No

**Temperature sensitive—Keep between 5 °C and 35 °C.**

**Note: Shipper must be appropriately trained and certified before involvement with the transport of dangerous goods.**

**Section 15: Regulatory Information****Canada****Domestic Substance List (DSL) / Non-Domestic Substance Lists (NDSL)**

All hazardous ingredients are listed on the DSL/NDSL.

**Hazardous Products Act (R.S.C., 1985, c. H-3)**

The safety data sheet and label comply with the Hazardous Product Act and WHMIS 2015.

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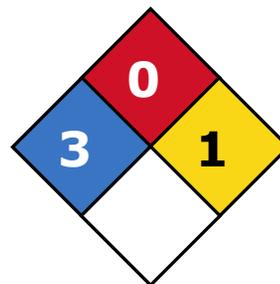
### USA

#### Other Classifications

##### HMIS® RATING

<b>HEALTH:</b>	* <b>3</b>
<b>FLAMMABILITY:</b>	<b>0</b>
<b>PHYSICAL HAZARD:</b>	<b>1</b>
<b>PERSONAL PROTECTION:</b>	

##### NFPA® 704 CODES



*Approximate HMIS and NFPA Risk Ratings Legend:*

0 (Low or none); 1 (Slight); 2 (Moderate); 3 (Serious); 4 (Severe)

##### CAA (Clean Air Act, USA)

This product does not contain any class 1 ozone depleting substances.

This product does not contain any class 2 ozone depleting substances.

This product does not contain substances that are listed as hazardous air pollutants.

##### EPCRA (Emergency Planning and Right to Know Act, USA, 40 CFR 372.45)

This product contains thiourea (CAS# 62-56-6; reportable quantity = 10 lb), which is subject to the reporting requirements of section 313 Title III of the SARA of 1986 and 40 CFR part 372.

##### TSCA (Toxic Substances Control Act of 1976, USA)

All substances are TSCA listed.

##### California Proposition 65 (Chemicals known to cause cancer or reproductive toxicity).

This product contains thiourea, which is listed as a carcinogen.

### Europe

##### RoHS (Restriction of Hazardous Substances Directive)

This product does not contain any lead, cadmium, mercury, hexavalent chromium, PBB's, PBDE's, DEHP, BBP, DBP, or DIBP and complies with European RoHS regulations.

##### WEEE (Waste Electrical and Electronic Equipment Directive)

This product is not a piece of electrical or electronics equipment and is therefore not governed by this regulation.

**421A****Section 16: Other Information**

<b>Prepared by the</b>	Regulatory Affairs Department
<b>Date of Review</b>	06 February 2023
<b>Supersedes</b>	02 November 2022
<b>Reason for Changes:</b>	Update transport section.

**Reference**

1) ACGIH 2022 TLVs and BEIs: Based on the documentation of the threshold limit values for chemical substances and physical agents & biological exposure indices, American Conference of Governmental of Industrial Hygienist Cincinnati, OH (2022).

**Abbreviations**

ACGIH	American Conference of Governmental Industrial Hygienists (USA)
EC50	Half maximal effective concentration
EL50	Half maximal effective loading
NOELR	No observable effect loading ratio
GHS	Globally Harmonized System of Classification of Labeling of Chemicals
LC50	Lethal Concentration 50%
LCLo	Lowest published lethal concentration
LD50	Lethal Dose 50%
PEL	Permissible Exposure Limit
STEL	Short-Term Exposure Limit
TCLo	Lowest published toxic concentration
TWA	Time Weighted Average
VOC	Volatile Organic Content

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**Technical Queries** Contact us regarding any questions, improvement suggestions, or problems with this product. Application notes, instructions, and FAQs are located at [www.mgchemicals.com](http://www.mgchemicals.com).

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