
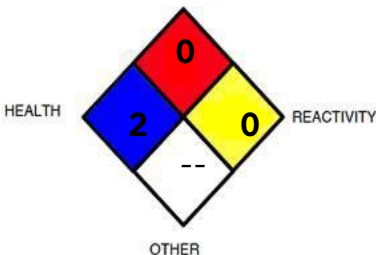
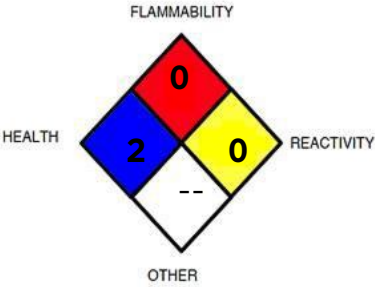


Safety Data Sheet

Section 1: Product & Company Identification	
Product Name:	Ruthenium Hexamine Trichloride
Product #:	R-3908
Synonyms:	Hexaammineruthenium Trichloride; Hexaammineruthenium(3+) Trichloride; Hexaammineruthenium Chloride
Supplier:	AG Scientific Holdings, LLC 9950 Scripps Lake Drive, Suite 104 San Diego CA 92131 Tele# + 858-452-9925
Emergency Tele#:	ChemTel, Tele# in USA 1-800-255-3924, International 1-813-248-0585

Section 2: Composition / Information on Ingredients			
Component	CAS#	EC #	% Composition
Ruthenium Hexamine Trichloride	14282-91-8	238-176-8	100

Section 3: Hazards Identification	
Symbols	
HMIS Classification	<p style="text-align: center;">FLAMMABILITY</p>  <p style="text-align: center;">HEALTH REACTIVITY</p> <p style="text-align: center;">OTHER</p>

NFPA Classification	
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Section 4: First Aid Measures

General Overview:	Avoid contact, wear suitable protective clothing, gloves and eye/face protection.
Inhalation:	If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing give artificial respiration, seek medical attention if symptoms occur.
Skin:	Wash immediately with water for 15 minutes. Remove contaminated clothing. Wash contaminated clothing before reuse. Seek medical attention if symptoms appear.
Eyes:	In case of contact, immediately flush eyes or skin with copious amounts of water for at least 15 minutes. Remove contacts. Assure adequate flushing of the eyes by separating the eyelids with fingers.
Ingestion:	If swallowed, DO NOT induce vomiting. Wash mouth with water, never give anything to unconscious person. Seek medical attention.
	See section 11 for more detailed information on health effects & symptoms

SECTION 5: Fire Fighting Measures

Flammability of the product:	No data available
Extinguishing Media:	Use water spray, dry chemical, carbon dioxide, or chemical foam.
Hazardous thermal (de)composition products:	Hydrogen chloride, Ruthenium oxides, Nitrogen oxides.
Special Fire Fighting Procedures:	Wear self-contained breathing apparatus (SCBA) and protective clothing to prevent contact with skin and eyes. Be sure to use an approved/certified respirator or equivalent.
Flash Point:	No data available

Section 6: Accidental Release Measures





Personal Precautions:	Use Personal Protection Equipment. Splash goggles. Gloves. Avoid dust formation.
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Environmental Precautions:	Do not let product enter drains.
Methods for Clean-up:	Sweep up & shovel into suitable disposal container. Ventilate area and wash spill site after material pickup is complete.

SECTION 7: Handling & Storage

Storage:	Store at -20°C (long term) and protect from light. Keep container tightly closed and in cool, dry, well ventilated area.
Handling:	Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.

SECTION 8: Exposure controls / Personal Protection

Respiratory Protection:	 <p>If exposure limit reached use ventilation system when handling or wear appropriate government (NIOSH/MSHA) approved respirator.</p>
Skin and Body:	  <p>Chemical-resistant gloves and lab coat/other protective clothing. Avoid prolonged or repeated exposure. Wash thoroughly after handling.</p>
Eyes:	 <p>Safety goggles.</p>
Ventilation/Engineering Measures:	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits.

Hygiene:	Wash hands after handling compound and before eating, smoking, using lavatory and at the end of the day.
Other:	Contains no substances with occupational exposure limit values.

SECTION 9: Physical and Chemical Properties

Appearance & Odor:	Light-yellow solid
Formula	$\text{Cl}_3\text{H}_{18}\text{N}_6\text{Ru}^{3+}$
Molecular Wt.	309.61 g/mol
Melting Pt.	N/A
Boiling Pt.	N/A
Density:	N/A
Vapor Pressure:	N/A
Evaporation Rate:	N/A
Vapor Density:	N/A
Solubility:	N/A
Flash Point:	N/A
Autoignition Temp:	N/A

SECTION 10: Stability and Reactivity

Stability:	Stable under proper storage conditions.
Hazardous decomposition products:	Hydrogen chloride, Ruthenium oxides, Nitrogen oxides
Materials to Avoid:	Strong oxidizing agents such as nitric acid may produce toxic volatile ruthenium tetroxide.
Conditions to avoid:	N/A

SECTION 11: Toxicological Information

RTECS#:	VM2651530
ACUTE Toxicity:	N/A
CHRONIC Toxicity:	N/A
Chronic Exposure: Carcinogen: Mutagen: Teratogen: Reproductive:	Mutagenic: Effects have occurred in experimental animals IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC. AGGIH: No component of this product present at levels greater than or equal to 0.1% is identified as probable, potential human carcinogen by ACGIH.

	<p>NTP: No component of this product present at levels greater than or equal to 0.1% is identified as known or, anticipated human carcinogen by NTP.</p> <p>OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as known or, potential human carcinogen by OSHA.</p> <p>EPA: No classification on carcinogenic data is available from EPA</p>
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SECTION 12: Ecological Information

Ecotoxicity:	N/A
Mobility:	N/A
Persistence and degradability:	N/A
Bioaccumulative potential:	N/A
Other adverse effects:	N/A
Corrosivity Characteristic:	N/A
General Notes:	Do not allow undiluted product or large quantities of it to reach groundwater, water course or sewer system. Slightly hazardous for water. Do not allow materials to be released into the environment without proper government permits.

SECTION 13: Disposal Considerations

Residue Waste or Unused product:	N/A
Contaminated Packaging:	Do not re-use empty containers. Dispose of as unused product. Cannot be disposed. Dispose of as unused product.

SECTION 14: Transportation Information

UN ID#:	N/A
ADR / RID (LAND):	Not shipping hazard
DOT regulations:	Not shipping hazard
IMDG/IMO (SEA):	Not shipping hazard
IATA/DGR (AIR):	Not shipping hazard
Special Provisions:	N/A

SECTION 15: Regulatory Information

Health Phrases:	<p>H315 Causes skin irritation.</p> <p>H319 Causes serious eye irritation.</p> <p>H335 May cause respiratory irritation.</p>
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Risk Phrases:	N/A
Safety Phrases:	<p>P261 Avoid breathing dust/fume/gas/mist/vapors/spray.</p> <p>P264 Wash skin thoroughly after handling.</p> <p>P271 Use only outdoors or in a well-ventilated area.</p> <p>P280 Wear protective gloves/protective clothing/eye protection/face protection.</p> <p>P302+P352 IF ON SKIN: Wash with plenty of soap and water.</p> <p>P304+P340 IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.</p> <p>P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</p> <p>P312 Call a poison center or doctor if you feel unwell.</p> <p>P321 Specific treatment (see supplemental first aid instructions on this label).</p> <p>P332+P313 If skin irritation occurs: Get medical advice/attention.</p> <p>P337+P313 If eye irritation persists: Get medical advice/attention.</p> <p>P362 Take off contaminated clothing and wash before reuse.</p> <p>P403+P233 Store in a well-ventilated place. Keep container tightly closed.</p> <p>P405 Store locked up.</p> <p>P501 Dispose of contents/container to an approved waste disposal plant.</p>
EU Regulations:	N/A
US Regulations:	<p>TSCA. No products were found.</p> <p>California Proposition 65: No products were found.</p>
U.S. Federal Regulations:	<p>SARA 302/304/311/312 extremely hazardous substances: No products were found</p> <p>SARA 302/304 emergency planning and notification: No products were found.</p> <p>SARA 302/304/311/312 hazardous chemicals: No products were found.</p> <p>SARA 311/312 MSDS distribution-chemical inventory-hazard identification: Acute Health Hazard</p> <p>SARA 313 toxic chemicals notification and release reporting: No products were found.</p> <p>Clean Water Act (CWA) 307: No products were found.</p> <p>Clean Water Act (CWA) 311: No products were found.</p> <p>Clean Air Act (CAA) 112 accidental release prevention: No products were found.</p> <p>Clean Air Act (CAA) 112 regulated flammable substances: No products were found.</p> <p>Clean Air Act (CAA) 112 regulated toxic substances: No products were found.</p> <p>OSHA: No products were found.</p>
WHMIS (Canada):	N/A

SECTION 16: Other Information



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