

LTS (CHEMICAL) INC
MATERIAL SAFETY DATA SHEET
RUTHENIUM CHLORIDE

GENERAL

MANUFACTURER/SUPPLIER: LTS RESEARCH LABORATORIES, INC.
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DATE MSDS PREPARED: 02/03/00
DATE MSDS REVISED: 11/6/2012

1. PRODUCT IDENTIFICATION

PRODUCT NAME: RUTHENIUM CHLORIDE
SYNONYM: RUTHENIUM (III) CHLORIDE TRIHYDRATE, RUTHENIUM TRICHLORIDE
CHEMICAL NATURE: METALLIC ELEMENT
FORMULA: $\text{RuCl}_3 \cdot 3\text{H}_2\text{O}$
CAS #: 14898-67-0

2. PHYSICAL AND CHEMICAL CHARACTERISTICS

BOILING POINT: N/A
MELTING POINT: N/A
SPECIFIC GRAVITY: 3.11 g/cc
EVAPORATION RATE: N/A
VAPOR DENSITY: N/A
VAPOR PRESSURE (mmHg): N/A
% VOLATILES: 60%
SOLUBILITY IN H_2O : SOLUBLE
APPEARANCE AND ODOR: RED-BROWN BLACK CRYSTAL, PUNGENT

3. HAZARD IDENTIFICATION

HAZARDOUS COMPONENTS %
RUTHENIUM CHLORIDE 0-100%
OSHA/PEL: N/A
ACGIH/TLV: N/A
HMIS RATINGS:
HEALTH: 1
FLAMMABILITY: 1
REACTIVITY: 0
SPECIAL: B
NFPA RATING:
Health: 1
Flammability: 1
Reactivity: 0

4. FIRE FIGHTING MEASURES

FLASH POINT: N/A
AUTOIGNITION TEMPERATURE: NON-FLAMMABLE
FLAMMABLE LIMITS:
UPPER: N/A
LOWER: N/A

FLAMMABILITY: HIGHLYFLAMMABLE

EXTINGUISHING MEDIA: USE EXTINGUISHING MEDIA SUITABLE FOR SURROUNDING MATERIALS AND TYPE OF FIRE

SPECIAL FIRE FIGHTING PROCEDURES: FIREFIGHTERS MUST WEAR FULL FACE, SELF-CONTAINED BREATHING APPARATUS WITH FULL PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.

UNUSUAL FIRE AND EXPLOSION HAZARDS: MAY EMIT TOXIC FUMES OF Cl_2 , RuO_4 UPON DECOMPOSITION

5. HEALTH HAZARD INFORMATION

EFFECTS OF EXPOSURE: TO THE BEST OF OUR KNOWLEDGE THE CHEMICAL, PHYSICAL AND TOXICOLOGICAL PROPERTIES OF RUTHENIUM CHLORIDE HAVE NOT BEEN THOROUGHLY INVESTIGATED AND REPORTED. CHLORIDES VARY WIDELY. SODIUM CHLORIDE (TABLE SALT) HAS VERY LOW TOXICITY, WHILE CARBONYL CHLORIDE (PHOSGENE) IS LETHAL IN SMALL DOSES (SAX, DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, EIGHTH EDITION).

INHALATION: MAY CAUSE IRRITATION IF EXPOSURE IS PROLONGED OR EXCESSIVE.

INGESTION: NO ADVERSE EFFECTS EXPECTED

SKIN: MAY CAUSE IRRITATION.

EYE: PROLONGED OR REPEATED CONTACT MAY CAUSE IRRITATION

CHRONIC AFFECTS: NONE KNOWN

ROUTES OF EXPOSURE: INHALATION, INGESTION, SKIN CONTACT, EYE CONTACT.

CARCINOGENITY:

NTP:	NO
IARC:	NO
OSHA:	NO

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE KNOWN

6. STABILITY

STABILITY: STABLE

CONDITION TO AVOID: NO DATA

INCOMPATIBILITY (MATERIAL TO AVOID): IRON CARBONYL, ZINC, MAGNESIUM, ALUMINUM

HAZARDOUS DECOMPOSITION PRODUCTS: HYDROGEN CHLORIDE, TOXIC METAL COMPOUNDS..

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

7. EMERGENCY AND FIRST AID PROCEDURES:

REMOVE ANY CLOTHING SOILED BY THE PRODUCT

INHALATION: SUPPLY FRESH AIR. IF REQUIRED, GIVE ARTIFIAL RESPIRATION. KEEP THE PERSON WARM. SEEK MEDICAL AID.

INGESTION: SEEK MEDICAL ADVICE.

SKIN: FLUSH WITH SOAP AND WATER FOR 15 MINUTES. SEEK MEDICAL ADVICE

EYE: FLUSH WITH WATER, INCLUDING UNDER EYELIDS, FOR AT LEAST 15 MINUTES. SEEK MEDICAL ADVICE.

8. HANDLING AND STORAGE

HANDLING AND STORAGE

STORE IN COOL DRY PLACE, KEEP TIGHTLY SEALED WHEN NOT IN USE, READ MSDS BEFORE USING.

9. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN

CASE MATERIAL IS

RELEASED OR SPILLED:

SWEEP OR VACUUM UP SPILL USING A HIGH EFFICIENCY PARTICULATE ABSOLUTE (HEPA) AIR FILTER AND PLACE IN AN AIRTIGHT PLASTIC CONTAINER. TAKE CARE NOT TO RAISE DUST.

RESPIRATORY PROTECTION

NIOSH/MSHA APPROVED DUST RESPIRATOR

VENTILATION:

USE LOCAL EXHAUST TO MAINTAIN CONCENTRATION AT GENERAL EXHAUST IS RECOMMENDED

LOW LEVELS.

SKIN PROTECTION:

WEAR FULL COVER CLOTHING AND RUBBER GLOVES TO MINIMIZE SKIN CONTACT

PROTECTIVE GLOVES:

RUBBER.

EYE PROTECTION:

SAFETY GOGGLES WITH SIDE SHIELDS

PROTECTIVE CLOTHING:

NORMAL LABWEAR.

WASTE DISPOSAL METHOD:

SHIP TO PRECIOUS METAL REFINER OR DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS

10. TOXICITY DATA

TO THE BEST OF OUR KNOWLEDGE, ACUTE AND CHRONIC TOXICITY OF THIS PRODUCT IS NOT FULLY KNOWN. EXPOSURE TO RUTHENIUM COMPOUND MAY CAUSE IRRITATION TO SKIN, CORROSIVE EFFECT TO EYES. NO SENSITIVITY EFFECT. NO CARCINOGENIC CLASSIFICATION S ARE AVAILABLE FROM THE EPA, IARC, NTP, OSHA OR ACGIH.

11. TRANSPORTATION DATA

UN NUMBER:

3260

HAZARD CLASS:

8

ADR/RID CLASS:

8 CORROSIVE SUBSTANCES

IMDG CLASS:

8

AIR TRAN. ICAO/IATA CLASS:

8

MARITIME TRAN. IMDG CLASS:

8

12. OTHER INFORMATION

THIS SAFETY DATA SHEET SHOULD BE USED IN CONJUNCTION WITH TECHNICAL SHEETS. IT DOES NOT REPLACE THEM. THE INFORMATION GIVEN IS BASED ON OUR KNOWLEDGE OF THIS PRODUCT, AT THE TIME OF PUBLICATION. IT IS GIVEN IN GOOD FAITH. THE ATTENTION OF THE USER IS DRAWN TO THE POSSIBLE RISKS INCURRED BY USING THE PRODUCT FOR ANY OTHER PURPOSE OTHER THAN THAT FOR WHICH IT WAS INTENDED. THIS DOES NOT IN ANY WAY EXCUSE THE USER FROM KNOWING AND APPLYING ALL THE REGULATIONS GOVERNING HIS ACTIVITY. IT IS THE SOLE RESPONSIBILITY OF THE USER TO TAKE ALL PRECAUTIONS REQUIRED IN HANDLING THE PRODUCT. THE AIM OF THE MANDATORY REGULATIONS MENTIONED IS TO HELP THE USER TO FULFILL HIS OBLIGATIONS REGARDING THE USE OF HAZARDOUS PRODUCTS.