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**MATERIAL SAFETY DATA SHEET (MSDS)****RUTHENIUM TRICHLORIDE (39% RU) (HYDRATE)****1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**

**Product name :** Ruthenium(III) chloride hydrate

**CAS-No. :** 14898-67-0

Product Coad: R0176300001

**Chemical Formula:** RuCl<sub>3</sub>.3H<sub>2</sub>O

**2. HAZARDS IDENTIFICATION**

Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]

Skin corrosion (Category 1B)

Classification according to EU Directives 67/548/EEC or 1999/45/EC Causes burns.

According to European Directive 67/548/EEC as amended. Hazard symbol(s)

R-phrases) R34 Causes burns.

S-phrases(s)

S26 In case of contact with eyes, rinse immediately with plenty of water and

seek medical advice.

S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S45 In case of accident or if you feel unwell, seek medical advice immediately

(show the label where possible).

Other hazards - none

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Substances

Formula : Cl<sub>3</sub>Ru · xH<sub>2</sub>O

Molecular Weight : 207,43 g/mol

Component Concentration

Ruthenium(III) chloride hydrate

CAS-No.      EC-No.

14898-67-0   233-167-5

**MATERIAL SAFETY DATA SHEET (MSDS)****RUTHENIUM TRICHLORIDE (39% RU) (HYDRATE)****4. FIRST AID MEASURES**

Description of first aid measures

General advice Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water.

Consult a physician.

Most important symptoms and effects, both acute and delayed Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., Cough, Shortness of breath, Headache, Nausea

Indication of immediate medical attention and special treatment needed no data available

**5. FIRE-FIGHTING MEASURES**

Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special hazards arising from the substance or mixture Hydrogen chloride gas, Ruthenium oxide

Precautions for fire-fighters Wear self contained breathing apparatus for fire fighting if necessary.

Further information no data available

**6. ACCIDENTAL RELEASE MEASURES**

Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure

adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

Environmental precautions Do not let product enter drains.

Methods and materials for containment and cleaning up Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

Reference to other sections For disposal see section 13.

**7. HANDLING AND STORAGE**

Precautions for safe handling

Avoid formation of dust and aerosols.

Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection. Conditions for safe storage, including any incompatibilities

Store in cool place. Keep container tightly closed in a dry and well-ventilated place.

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Hygroscopic Specific end uses no data available

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

Control parameters

Components with workplace control parameters

Exposure controls

Appropriate engineering controls Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under

appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of

contaminated gloves after use in accordance with applicable laws and good laboratory practices.

Wash and dry hands. Body Protection Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Respiratory protection Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**9. PHYSICAL AND CHEMICAL PROPERTIES**

Information on basic physical and chemical properties

a) Appearance Form: powder Colour: dark grey

b) Odour no data available

c) Odour Threshold no data available

d) pH no data available

e) Melting/freezing point no data available

f) Initial boiling point and boiling range no data available

g) Flash point not applicable

h) Evaporation rate no data available

i) Flammability (solid, gas) no data available

j) Upper/lower flammability or explosive limits no data available

k) Vapour pressure no data available

l) Vapour density no data available

m) Relative density no data available

n) Water solubility no data available

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o) Partition coefficient: noctanol/water no data available

p) Autoignition temperature no data available

q) Decomposition temperature no data available

r) Viscosity no data available

s) Explosive properties no data available

t) Oxidizing properties no data available

**10. STABILITY AND REACTIVITY**

Reactivity no data available

Chemical stability no data available

Possibility of hazardous reactions no data available

Conditions to avoid no data available

Incompatible materials Zinc

Hazardous decomposition products Other decomposition products - no data available

**11. TOXICOLOGICAL INFORMATION**

Information on toxicological effects

Acute toxicity no data available

Skin corrosion/irritation no data available

Serious eye damage/eye irritation no data available

Respiratory or skin sensitization no data available

Germ cell mutagenicity no data available

Carcinogenicity 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.

Reproductive toxicity no data available

Specific target organ toxicity - single exposure no data available

Specific target organ toxicity - repeated exposure no data available

Aspiration hazard no data available

Potential health effects Inhalation May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

Ingestion May be harmful if swallowed. Causes burns.

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Skin May be harmful if absorbed through skin. Causes skin burns.

Eyes Causes eye burns. Signs and Symptoms of Exposure

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., Cough, Shortness of breath, Headache, Nausea

Additional Information

RTECS: Not available

**12. ECOLOGICAL INFORMATION**

Toxicity no data available

Persistence and degradability no data available

Bioaccumulative potential no data available

Mobility in soil no data available

Results of PBT and vPvB assessment no data available

Other adverse effects no data available

**13. DISPOSAL CONSIDERATIONS**

Waste treatment methods

Product Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional

waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent

and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging Dispose of as unused product.

**14. TRANSPORT INFORMATION**

UN-Number

ADR/RID: 3260 IMDG: 3260 IATA: 3260

UN proper shipping name

ADR/RID: CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (Ruthenium(III) chloride hydrate)

IMDG: CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (Ruthenium(III) chloride hydrate)

IATA: Corrosive solid, acidic, inorganic, n.o.s. (Ruthenium(III) chloride hydrate)

Transport hazard class(es)

ADR/RID: 8 IMDG: 8 IATA: 8

Packaging group

ADR/RID: II IMDG: II IATA: II

Environmental hazards

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ADR/RID: no IMDG Marine pollutant: no IATA: no

Special precautions for users

no data available

**15. REGULATORY INFORMATION**

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

Safety, health and environmental regulations/legislation specific for the substance or mixture

no data available

Chemical Safety Assessment

no data available

**16. Other Information**

**Product Use:** Laboratory Reagent.

In accordance with REACH Regulation (CE) N° 1907/2006 and with CLP Regulation (CE) N° 1272/2008

**DISCLAIMER:**

- **SUVCHEM** Products are to be used as Lab Chemicals for R&D only. Not for drug, medicinal, household or other uses.
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- **SUVCHEM** provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product.

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