SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

- Trade name: Ruthenium, Ruthenium pellets, Ruthenium powder, Ruthenium black
- CAS Number: 7440-18-8
- EC number: 231-127-1

1.2 Relevant identified uses of the substance or mixture and uses advised against
No further relevant information available.

1.3 Application of the substance / the mixture
Preparation of catalysts
Precious metal alloy for technical purposes
Intermediate

Manufacturer/Supplier:
Heraeus Deutschland GmbH & Co. KG
Heraeusstr. 12-14
D-63450 Hanau
Germany
Tel: +49-(0)6181-355707

Further information obtainable from: sds@heraeus.com

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

- Classification according to Regulation (EC) No 1272/2008
  The substance is not classified according to the CLP regulation.

- Classification according to Directive 67/548/EEC or Directive 1999/45/EC Not applicable.

Information concerning particular hazards for human and environment: Not applicable.

2.2 Label elements

- Labelling according to Regulation (EC) No 1272/2008 Void
- Hazard pictograms Void
- Signal word Void
- Hazard statements Void
- Results of PBT and vPvB assessment
  - PBT: Not applicable.
  - vPvB: Not applicable.

SECTION 3: Composition/information on ingredients

3.1 Chemical characterisation: Substances

- CAS No. Description
  7440-18-8 Ruthenium
- Identification number(s)
  - EC number: 231-127-1

SECTION 4: First aid measures

4.1 Description of first aid measures

- General information: In case of accident or if you feel unwell, seek medical advice immediately.
- After inhalation: After inhalation of dust or powder seek medical advice.
- After skin contact:
  Fine sized material wash off with plenty of water.
  If skin irritation continues, consult a doctor.
- After eye contact:
  Fine sized material in the eye rinse immediately with plenty of water (15 minutes), also under the eyelids.

(Contd. on page 2)
Trade name: Ruthenium, Ruthenium pellets, Ruthenium powder, Ruthenium black

Call a doctor immediately.

· After swallowing:
  - Rinse mouth with water after swallowing of fine sized material.
  - If symptoms persist consult doctor.

· 4.2 Most important symptoms and effects, both acute and delayed No further relevant information available.

· 4.3 Indication of any immediate medical attention and special treatment needed
  - No further relevant information available.

SECTION 5: Firefighting measures

· 5.1 Extinguishing media
  · Suitable extinguishing agents:
    - Use fire extinguishing methods suitable to surrounding conditions.
    - CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

· 5.2 Special hazards arising from the substance or mixture
  - The product is not combustible.
  - Fine sized metal shows catalytic effects and can accelerate combustion processes. Keep away from combustible material.

· 5.3 Advice for firefighters
  · Protective equipment: No special measures required.

SECTION 6: Accidental release measures

· 6.1 Personal precautions, protective equipment and emergency procedures
  - Avoid formation of dust.

· 6.2 Environmental precautions: No special measures required.

· 6.3 Methods and material for containment and cleaning up:
  - Pick up mechanically.
  - Send for recovery or disposal in suitable receptacles.

· 6.4 Reference to other sections
  - See Section 7 for information on safe handling.
  - See Section 8 for information on personal protection equipment.
  - See Section 13 for disposal information.

SECTION 7: Handling and storage

· 7.1 Precautions for safe handling
  - Wear protective equipment. Keep unprotected persons away.
  - Prevent formation of dust.

· Information about fire - and explosion protection:
  - The product is not combustible.
  - see chapter 5

· 7.2 Conditions for safe storage, including any incompatibilities
  · Storage:
    - Requirements to be met by storerooms and receptacles: No special requirements.
    - Information about storage in one common storage facility: Not required.
    - Further information about storage conditions: None.

· 7.3 Specific end use(s) No further relevant information available.

SECTION 8: Exposure controls/personal protection

· Additional information about design of technical facilities: No further data; see item 7.
8.1 Control parameters
- Ingredients with limit values that require monitoring at the workplace:
- Additional information: The lists valid during the making were used as basis.

8.2 Exposure controls
- Personal protective equipment:
  - General protective and hygienic measures:
    Wash hands before breaks and at the end of work.
    Do not eat or drink while working.
    Do not inhale dust / smoke / mist.
  - Respiratory protection: If dust or spray is present use respiratory protection filter P3.
  - Protection of hands: No chemical-protective gloves required.
  - Eye protection:
    Necessarily if material in form of dust is present.
    Safety glasses
  - Body protection: Light weight protective clothing

SECTION 9: Physical and chemical properties
9.1 Information on basic physical and chemical properties
- General Information
  - Appearance:
    Form: Solid in various forms
    Particulate
    Powder
  - Colour: Silver-coloured
  - Odour: Odourless
  - Odour threshold: Not determined.
  - pH-value: Not applicable.
  - Change in condition
    Melting point/Melting range: 2500 °C
    Boiling point/Boiling range: 4900 °C
  - Flash point: Not applicable.
  - Flammability (solid, gaseous): Product is not flammable.
  - Ignition temperature:
    Decomposition temperature: Not determined.
  - Self-igniting: Not determined.
  - Danger of explosion: Product does not present an explosion hazard.
  - Vapour pressure: Not applicable.
  - Density at 20 °C: 12,45 g/cm³
  - Relative density: Not determined.
  - Vapour density: Not applicable.
  - Evaporation rate: Not applicable.
  - Solubility in / Miscibility with water: Insoluble.
  - Partition coefficient (n-octanol/water): Not determined.
  - Viscosity:
    Dynamic: Not applicable.
    Kinematic: Not applicable.
SECTION 10: Stability and reactivity

- 10.1 Reactivity
- 10.2 Chemical stability
  - Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- 10.3 Possibility of hazardous reactions: No dangerous reactions known.
- 10.4 Conditions to avoid: No further relevant information available.
- 10.5 Incompatible materials: No further relevant information available.
- 10.6 Hazardous decomposition products: No dangerous decomposition products known.
  - Additional information: -

SECTION 11: Toxicological information

- 11.1 Information on toxicological effects
  - Acute toxicity:
  - Primary irritant effect:
    - on the skin: No irritant effect.
    - on the eye: No irritating effect.
  - Sensitisation: No sensitising effects known.
  - Additional toxicological information:
    When used and handled according to specifications, the product does not have any harmful effects to our experience and the information provided to us.
    The substance is not subject to classification according to the latest version of the EU lists.

SECTION 12: Ecological information

- 12.1 Toxicity
  - Aquatic toxicity: No further relevant information available.
- 12.2 Persistence and degradability: No further relevant information available.
- 12.3 Bioaccumulative potential: No further relevant information available.
- 12.4 Mobility in soil: No further relevant information available.
  - Additional ecological information:
    General notes: Generally not hazardous for water
- 12.5 Results of PBT and vPvB assessment
  - PBT: Not applicable.
  - vPvB: Not applicable.
- 12.6 Other adverse effects: No further relevant information available.

SECTION 13: Disposal considerations

- 13.1 Waste treatment methods
  - Recommendation: Contact manufacturer for recycling information.
    Disposal must be made according to official regulations.
  - Uncleaned packaging:
    - Recommendation: Disposal must be made according to official regulations.

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### SECTION 14: Transport information

- **14.1 UN-Number**
  - ADR, IMDG, IATA: Void

- **14.2 UN proper shipping name**
  - ADR, IMDG, IATA: Void

- **14.3 Transport hazard class(es)**
  - ADR, IMDG, IATA: Void

- **14.4 Packing group**
  - ADR, IMDG, IATA: Void

- **14.5 Environmental hazards:**
  - Marine pollutant: No

- **14.6 Special precautions for user**
  - Not applicable.

- **14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**
  - Not applicable.

- **UN "Model Regulation":** -

### SECTION 15: Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
  - No further relevant information available.

- **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

### SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Department issuing MSDS:** HH-EHS- Chemical Safety

- **Abbreviations and acronyms:**
  - RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
  - ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
  - IMDG: International Maritime Code for Dangerous Goods
  - IATA: International Air Transport Association
  - GHS: Globally Harmonised System of Classification and Labelling of Chemicals
  - EINECS: European Inventory of Existing Commercial Chemical Substances
  - CAS: Chemical Abstracts Service (division of the American Chemical Society)

- * Data compared to the previous version altered.*