**Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013**

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THECOMPANY/UNDERTAKING

**Product Identifier**

**Perihalan Produk:** **Copper based medium temperature water gas shift catalyst, HiFUEL® W230**
**Product Description:** **Copper based medium temperature water gas shift catalyst, HiFUEL® W230**
**Cat No. :** 45470

**Relevant identified uses of the substance or mixture and uses advised against**

**Recommended Use** Laboratory chemicals.
**Uses advised against** No Information available

**Company**

Thermo Fisher Scientific Fisher Scientific (M) Sdn Bhd
Hap Seng Business Park, Lot 01-03, 01-04 Aras 1 Unity Square,
No 12, Persiaran Perusahaan, Seksyen 23, 40300 Shah Alam,
Selangor Darul Ehsan, Malaysia.
Main line: +60 3-5525 7888

**Supplier**

**E-mail address** Enquiry.my@thermofisher.com

**Emergency Telephone Number**

Tel: +03-5525 7888
CHEMTREC Malaysia **1-800-815-308** (Malay)
CHEMTREC Malaysia (Kuala Lumpur) **+(60)-327884561** (Malay)

## SECTION 2: HAZARDS IDENTIFICATION

**Classification of the substance or mixture**

| | |
|---|---|
| Acute aquatic toxicity | Category 1 (H400) |
| Chronic aquatic toxicity | Category 1 (H410) |

**Label Elements**

**Signal Word** **Warning**

**Hazard Statements**
H410 - Very toxic to aquatic life with long lasting effects

**Precautionary Statements**
**Storage**
P403 - Store in a well-ventilated place
**Disposal**
P501 - Dispose of contents/ container to an approved waste disposal plant

**Other Hazards**

Toxic to terrestrial vertebrates
This product does not contain any known or suspected endocrine disruptors

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

| Component | CAS No | Weight % |
|---|---|---|
| Copper oxide | 1317-38-0 | 64.2 |
| Zinc oxide | 1314-13-2 | 24.5 |
| Aluminum oxide | 1344-28-1 | 9.8 |
| Magnesium oxide | 1309-48-4 | 1.5 |

## SECTION 4: FIRST AID MEASURES

**Description of first aid measures**

**General Advice** If symptoms persist, call a physician.

**Eye Contact** Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

**Skin Contact** Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

**Ingestion** Clean mouth with water and drink afterwards plenty of water. Get medical attention if symptoms occur.

**Inhalation** Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.

**Self-Protection of the First Aider** No special precautions required.

**Most important symptoms and effects, both acute and delayed**

None reasonably foreseeable.

**Indication of any immediate medical attention and special treatment needed**

**Notes to Physician** Treat symptomatically.

## SECTION 5: FIREFIGHTING MEASURES

**Extinguishing media**
**Suitable Extinguishing Media**
Not combustible.

**Extinguishing media which must not be used for safety reasons**

No information available.

**Special hazards arising from the substance or mixture**
Do not allow run-off from fire-fighting to enter drains or water courses.

**Hazardous Combustion Products**
Metal oxides.

**Advice for fire-fighters**
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

**Personal Precautions, Protective Equipment and Emergency Procedures**
Ensure adequate ventilation. Use personal protective equipment as required. Avoid dust formation.

**Environmental precautions**
Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained. Should not be released into the environment.

**Methods and Material for Containment and Cleaning Up**
Sweep up and shovel into suitable containers for disposal. Keep in suitable, closed containers for disposal.

**Reference to Other Sections**
Refer to protective measures listed in Sections 8 and 13.

## SECTION 7: HANDLING AND STORAGE

**Precautions for Safe Handling**
Wear personal protective equipment/face protection. Ensure adequate ventilation. Avoid ingestion and inhalation. Avoid dust formation. Do not get in eyes, on skin, or on clothing.

**Conditions for Safe Storage, Including any Incompatibilities**
Keep container tightly closed in a dry and well-ventilated place.

**Specific End Uses**
Use in laboratories.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

**Control Parameters**

| Component | Malaysia | ACGIH TLV | OSHA PEL |
|---|---|---|---|
| Copper oxide | | TWA: 1 mg/m$^3$ | |
| Zinc oxide | | TWA: 2 mg/m$^3$<br>STEL: 10 mg/m$^3$ | (Vacated) TWA: 5 mg/m$^3$<br>(Vacated) TWA: 10 mg/m$^3$<br>(Vacated) STEL: 10 mg/m$^3$<br>TWA: 5 mg/m$^3$<br>TWA: 15 mg/m$^3$ |

| | | | |
|---|---|---|---|
| Aluminum oxide | | TWA: 1 mg/m³ | (Vacated) TWA: 10 mg/m³<br>(Vacated) TWA: 5 mg/m³<br>TWA: 15 mg/m³<br>TWA: 5 mg/m³ |
| Magnesium oxide | | TWA: 10 mg/m³ | (Vacated) TWA: 10 mg/m³<br>TWA: 15 mg/m³ |

| Component | European Union | The United Kingdom | Germany |
|---|---|---|---|
| Copper oxide | | STEL: 2 mg/m³ 15 min<br>TWA: 1 mg/m³ 8 hr | TWA: 0.01 mg/m³ (8 Stunden). MAK<br>Höhepunkt: 0.02 mg/m³ |
| Zinc oxide | | | TWA: 0.1 mg/m³ (8 Stunden). MAK<br>TWA: 2 mg/m³ (8 Stunden). MAK<br>Höhepunkt: 0.4 mg/m³<br>Höhepunkt: 4 mg/m³ |
| Aluminum oxide | | STEL: 30 mg/m³ 15 min<br>STEL: 12 mg/m³ 15 min<br>TWA: 10 mg/m³ 8 hr<br>TWA: 4 mg/m³ 8 hr | TWA: 1.25 mg/m³ (8 Stunden). AGW - exposure factor 2<br>TWA: 10 mg/m³ (8 Stunden). AGW - exposure factor 2<br>TWA: 4 mg/m³ (8 Stunden). MAK<br>TWA: 1.5 mg/m³ (8 Stunden). MAK |
| Magnesium oxide | | STEL: 30 mg/m³ 15 min<br>STEL: 12 mg/m³ 15 min<br>TWA: 10 mg/m³ 8 hr<br>TWA: 4 mg/m³ 8 hr | TWA: 1.25 mg/m³ (8 Stunden). AGW - exposure factor 2<br>TWA: 10 mg/m³ (8 Stunden). AGW - exposure factor 2<br>TWA: 0.3 mg/m³ (8 Stunden). MAK multiplied by the material density<br>TWA: 4 mg/m³ (8 Stunden). MAK<br>Höhepunkt: 2.4 mg/m³ |

**Exposure Controls**

**Engineering Measures**

None under normal use conditions.

**Personal protective equipment**

**Eye Protection** Wear safety glasses with side shields (or goggles)

**Hand Protection** Protective gloves

**Skin and body protection** Long sleeved clothing

Inspect gloves before use.
Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)
Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.
Remove gloves with care avoiding skin contamination.

**Respiratory Protection** No protective equipment is needed under normal use conditions

**Recommended Filter type:** Particle filter

**Hygiene Measures** Handle in accordance with good industrial hygiene and safety practice

**Environmental exposure controls** Prevent product from entering drains Do not allow material to contaminate ground water system Local authorities should be advised if significant spillages cannot be contained

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

**Information on basic physical and chemical properties**

| | | |
|---|---|---|
| **Appearance** | | |
| **Physical State** | Solid Pellets | |
| **Odor** | No information available | |
| **Odor Threshold** | No data available | |
| **pH** | No information available | |
| **Melting Point/Range** | No data available | |
| **Softening Point** | No data available | |
| **Boiling Point/Range** | No information available | |
| **Flash Point** | No information available | **Method -** No information available |
| **Evaporation Rate** | Not applicable | Solid |
| **Flammability (solid,gas)** | No information available | |
| **Explosion Limits** | No data available | |
| **Vapor Pressure** | No data available | |
| **Vapor Density** | Not applicable | Solid |
| **Specific Gravity / Density** | No data available | |
| **Bulk Density** | No data available | |
| **Water Solubility** | Insoluble in water | |
| **Solubility in other solvents** | No information available | |
| **Partition Coefficient (n-octanol/water)** | | |
| **Autoignition Temperature** | No data available | |
| **Decomposition Temperature** | No data available | |
| **Viscosity** | Not applicable | Solid |
| **Explosive Properties** | No information available | |
| **Oxidizing Properties** | No information available | |

## SECTION 10: STABILITY AND REACTIVITY

**Reactivity**

None known, based on information available.

**Chemical Stability**

Stable under normal conditions.

**Possibility of Hazardous Reactions**

| | |
|---|---|
| **Hazardous Polymerization** | No information available. |
| **Hazardous Reactions** | None under normal processing. |

**Conditions to Avoid**

None known.

**Incompatible Materials**

Oxidizing agent.

**Hazardous Decomposition Products**

Metal oxides.

## SECTION 11: TOXICOLOGICAL INFORMATION

**Information on Toxicological Effects**

**Product Information**

**(a) acute toxicity;**

**Oral** Based on available data, the classification criteria are not met
**Dermal** No data available
**Inhalation** No data available

**Toxicology data for the components**

| Component | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|
| Copper oxide | - | LD50 > 2000 mg/kg ( Rat ) | - |
| Zinc oxide | LD50 > 5000 mg/kg ( Rat ) | LD50 > 2000 mg/kg, 24h (Rat) | LC50 > 5.7 mg/L, 4h (Rat) |
| Aluminum oxide | > 5000 mg/kg ( Rat )<br>(OECD Guideline 401) | - | > 2.3 mg/l 4 h<br>(OECD Guideline 403) |
| Magnesium oxide | LD50 = 3870 mg/kg ( Rat )<br>LD50 = 3990 mg/kg ( Rat ) | - | - |

**(b) skin corrosion/irritation;** No data available

**(c) serious eye damage/irritation;** No data available

**(d) respiratory or skin sensitization;**

**Respiratory** No data available
**Skin** No data available

| Component | Test method | Test species | Study result |
|---|---|---|---|
| Zinc oxide<br>1314-13-2 ( 24.5 ) | in vivo<br>OECD Test Guideline 406<br>Test method B.6 | guinea pig | non-sensitising |

**(e) germ cell mutagenicity;** No data available

| Component | Test method | Test species | Study result |
|---|---|---|---|
| Zinc oxide<br>1314-13-2 ( 24.5 ) | in vitro<br>OECD Test Guideline 471<br>Bacterial Reverse Mutation Test<br>---<br>in vivo<br>OECD Test Guideline 474<br>Mammalian | in vitro: Bacteria<br>---<br>in vivo<br>Mammalian | negative<br>---<br>negative |

**(f) carcinogenicity;** No data available

The table below indicates whether each agency has listed any ingredient as a carcinogen

| Component | EU | UK | Germany | IARC |
|---|---|---|---|---|
| Aluminum oxide | | | Cat. 2 (Fibre dust) | |

**(g) reproductive toxicity;** No data available

**(h) STOT-single exposure;** No data available

**(i) STOT-repeated exposure;** No data available

**Target Organs** No information available.

**(j) aspiration hazard;** Not applicable
Solid

**Symptoms / effects,both acute and delayed** No information available.

**Endocrine Disrupting Properties** Assess endocrine disrupting properties for human health. This product does not contain any known or suspected endocrine disruptors.

## SECTION 12: ECOLOGICAL INFORMATION

**Ecotoxicity effects** The product contains following substances which are hazardous for the environment. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May cause long-term adverse effects in the environment. Do not allow material to contaminate ground water system.

| Component | Freshwater Fish | Water Flea | Freshwater Algae | Microtox |
|---|---|---|---|---|
| Copper oxide | Onchorhynchus mykiss: LC50: 25 mg/L/48h | Daphnia: EC50: 0.04 mg/L/48h | | |
| Zinc oxide | LC50: = 1.55 mg/L, 96h static (Danio rerio) | | | |

**Persistence and degradability** Product contains heavy metals. Discharge into the environment must be avoided. Special pre-treatment is necessary

**Persistence** Insoluble in water, May persist.

**Degradability** Not relevant for inorganic substances.

**Degradation in sewage treatment plant** Contains substances known to be hazardous to the environment or not degradable in waste water treatment plants.

**Bioaccumulative potential** May have some potential to bioaccumulate; Product has a high potential to bioconcentrate

**Mobility in soil** Spillage unlikely to penetrate soil. Is not likely mobile in the environment due its low water solubility.

**Endocrine Disruptor Information** This product does not contain any known or suspected endocrine disruptors

**Other adverse effects** No information available

## SECTION 13: DISPOSAL CONSIDERATIONS

**Waste treatment methods**

**Waste from Residues/Unused Products** Should not be released into the environment Waste is classified as hazardous Dispose of in accordance with the European Directives on waste and hazardous waste Dispose of in accordance with local regulations

**Contaminated Packaging** Dispose of this container to hazardous or special waste collection point.

**Other Information** Do not flush to sewer Waste codes should be assigned by the user based on the application for which the product was used Do not empty into drains Do not let this chemical enter the environment

## SECTION 14: TRANSPORT INFORMATION

**IMDG/IMO**

**UN-No** UN3077
**Hazard Class** 9
**Packing Group** III
**Proper Shipping Name** Environmentally hazardous substances, solid, n.o.s.

**Road and Rail Transport**

**UN-No** UN3077
**Hazard Class** 9
**Packing Group** III
**Proper Shipping Name** Environmentally hazardous substances, solid, n.o.s.

**IATA**

**UN-No** UN3077
**Hazard Class** 9
**Packing Group** III
**Proper Shipping Name** Environmentally hazardous substances, solid, n.o.s.

**Special Precautions for User** No special precautions required

## SECTION 15: REGULATORY INFORMATION

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

**International Inventories** X = listed

| Component | EINECS | TSCA | DSL | PICCS | ENCS | ISHL | IECSC | AICS | KECL |
|---|---|---|---|---|---|---|---|---|---|
| Copper oxide | 215-269-1 | X | X | X | X | X | X | X | KE-08942 |
| Zinc oxide | 215-222-5 | X | X | X | X | X | X | X | KE-35565 |
| Aluminum oxide | 215-691-6 | X | X | X | X | X | X | X | KE-01012 |
| Magnesium oxide | 215-171-9 | X | X | X | X | X | X | X | KE-22728 |

| Component | Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major | Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety | Rotterdam Convention (PIC) | Basel Convention (Hazardous Waste) |
|---|---|---|---|---|

| | Accident Notification | Report Requirements | | |
|---|---|---|---|---|
| Copper oxide | | | | Annex I - Y22 |
| Zinc oxide | | | | Annex I - Y23 |

**National Regulations**

**Persistent Organic Pollutant** This product does not contain any known or suspected substance
**Ozone Depletion Potential** This product does not contain any known or suspected substance

## SECTION 16: OTHER INFORMATION

**Legend**

**CAS** - Chemical Abstracts Service

**EINECS/ELINCS** - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
**PICCS** - Philippines Inventory of Chemicals and Chemical Substances
**IECSC** - Chinese Inventory of Existing Chemical Substances
**KECL** - Korean Existing and Evaluated Chemical Substances

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory
**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List
**ENCS** - Japanese Existing and New Chemical Substances
**AICS** - Australian Inventory of Chemical Substances
**NZIoC** - New Zealand Inventory of Chemicals

**WEL** - Workplace Exposure Limit
**ACGIH** - American Conference of Governmental Industrial Hygienists
**RPE** - Respiratory Protective Equipment
**LC50** - Lethal Concentration 50%
**POW** - Partition coefficient Octanol:Water

**TWA** - Time Weighted Average
**IARC** - International Agency for Research on Cancer
**LD50** - Lethal Dose 50%
**EC50** - Effective Concentration 50%

**ADR** - European Agreement Concerning the International Carriage of Dangerous Goods by Road
**IMO/IMDG** - International Maritime Organization/International Maritime Dangerous Goods Code
**OECD** - Organisation for Economic Co-operation and Development
**BCF** - Bioconcentration factor

**ICAO/IATA** - International Civil Aviation Organization/International Air Transport Association
**MARPOL** - International Convention for the Prevention of Pollution from Ships
**ATE** - Acute Toxicity Estimate
**VOC** - (Volatile Organic Compound)

**Key literature references and sources for data**
https://echa.europa.eu/information-on-chemicals
Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

**Prepared By** Health, Safety and Environmental Department
**Revision Date** 31-Mar-2025
**Revision Summary** Not applicable.

**In accordance with local and national regulations: Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013**

### Disclaimer

**The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text**

## End of Safety Data Sheet