SAFETY DATA SHEET

# Cu-BTC (HKUST-1)

*ACS Material Metal-Organic Framework Cu-BTC (HKUST-1) · Version 1.3 / EN · Revision Date: 10/27/2026*

CONTENTS

Identification · Hazards · Composition · First Aid

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Revision Date **10/27/2026**

SECTION 1

## Identification of the Product and of the Company

**1.1 Product identifiers**

**Product Name :** ACS Material Metal-Organic Framework Cu-BTC (HKUST-1)

**Brand :** ACS Material LLC

**CAS-No. :** 51937-85-0

**Product Number :** MMCU0005 (5 g)

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

**Identified uses :** Laboratory chemicals, Manufacturing of substances

**Restrictions on use :** No data available

**1.3 Details of the supplier of the safety data sheet**

**Company :** ACS MATERIAL LLC

959 E Walnut Street, Suite 100, Pasadena, CA 91106, USA

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**1.4 Emergency telephone number**

**Emergency Phone # :** +1 (866)-227-0656

SECTION 2

## Hazards Identification

**2.1 Classification of the substance or mixture**

**GHS Classification in accordance with 29 CFR 1910.1200 (OSHA HCS)**

Acute toxicity, Oral (Category 3), H301

Skin irritation (Category 2), H315

Eye irritation (Category 2A), H319

**Additional GHS environmental classification (not covered by OSHA HCS)**

Hazardous to the aquatic environment, chronic — Category 1 (H410).

For the full text of the H-Statements mentioned in this Section, see Section 16.

**2.2 GHS Label elements, including precautionary statements**

**Pictogram**



**Signal word :** Danger

**Hazard statement(s)**

| | |
|---|---|
| **H301** | Toxic if swallowed. |
| **H315** | Causes skin irritation. |
| **H319** | Causes serious eye irritation. |
| **H410** | Very toxic to aquatic life with long lasting effects. |

**Precautionary statement(s)**

| | |
|---|---|
| **P260** | Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. |
| **P264** | Wash skin thoroughly after handling. |
| **P270** | Do not eat, drink or smoke when using this product. |
| **P273** | Avoid release to the environment. |
| **P280** | Wear protective gloves/ protective clothing/ eye protection/ face protection. |
| **P301 + P310** | IF SWALLOWED: Immediately call a POISON CENTER/ doctor. |
| **P330** | Rinse mouth. |
| **P302 + P352** | IF ON SKIN: Wash with plenty of water. |
| **P332 + P313** | If skin irritation occurs: Get medical advice/ attention. |
| **P362 + P364** | Take off contaminated clothing and wash it before reuse. |
| **P305 + P351 + P338** | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| **P337 + P313** | If eye irritation persists: Get medical advice/ attention. |
| **P391** | Collect spillage. |
| **P405** | Store locked up. |
| **P501** | Dispose of contents/ container to an approved waste disposal plant. |

**2.3 Hazards not otherwise classified (HNOC) or not covered by GHS**

No data available

SECTION 3

## Composition / Information on Ingredients

**3.1 Substances**

**Substance name :** Metal-Organic Framework Cu-BTC (HKUST-1)

**Synonyms :** Copper benzene-1,3,5-tricarboxylate; Cu-BTC MOF; HKUST-1; Cu3(BTC)2 (BTC = benzene-1,3,5-tricarboxylate)

**Formula :** C18H6Cu3O12

**Molecular weight :** 604.87 g/mol

**CAS number :** 51937-85-0

**Chemical characterization :** Metal–organic framework (copper benzene-1,3,5-tricarboxylate); not an aluminosilicate zeolite.

**Components**

| Component | CAS-No. | Concentration |
|---|---|---|
| **Copper benzene-1,3,5-tricarboxylate** | 51937-85-0 | ≥99% |
| **Benzene-1,3,5-tricarboxylic acid** | 554-95-0 | <1% |
| **Copper(II) nitrate trihydrate** | 10031-43-3 | <1% |

SECTION 4

## First Aid Measures

### 4.1 Description of first aid measures

**General advice**

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

**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 plenty of water. If skin irritation occurs, get medical advice/attention.

**In case of eye contact**

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

**If swallowed**

Never give anything by mouth to an unconscious person. Rinse mouth with water. Immediately call a POISON CENTER or doctor.

### 4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

### 4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5

## Firefighting Measures

### 5.1 Extinguishing media

**Suitable extinguishing media**

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

**Unsuitable extinguishing media**

No data available

### 5.2 Special hazards arising from the substance or mixture

Hazardous decomposition products formed under fire conditions: carbon oxides, copper oxides. See Section 10.6.

### 5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

### 5.4 Further information

No data available

SECTION 6

## Accidental Release Measures

### 6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

### 6.3 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.

### 6.4 Reference to other sections

For disposal see section 13.

SECTION 7

## Handling and Storage

### 7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

### 7.2 Conditions for safe storage, including any incompatibilities

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

### 7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8

## Exposure Controls / Personal Protection

### 8.1 Control parameters

Copper dusts and mists (as Cu): OSHA PEL — 1 mg/m$^3$ (8-hour TWA); NIOSH REL — 1 mg/m$^3$ (TWA).

These limits are expressed as the mass of copper in air, not as total product dust.

### 8.2 Exposure controls

#### Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

### 8.3 Personal protective equipment

#### Eye/face protection

Wear eye protection suitable for dust exposure and compliant with 29 CFR 1910.133.

#### 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 recommended. 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 respiratory protection is required, use a NIOSH-approved respirator selected for the identified airborne contaminants and exposure levels in accordance with 29 CFR 1910.134.

**Control of environmental exposure**

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

SECTION 9

## Physical and Chemical Properties

**9.1 Information on basic physical and chemical properties**

| | |
|---|---|
| **a) Appearance** | Physical state: Solid. Form: Powder (octahedral crystals). Color: Blue. |
| **b) Odour** | No data available |
| **c) Odour threshold** | No data available |
| **d) pH** | No data available |
| **e) Melting point/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) Relative vapor density** | No data available |
| **m) Relative density** | No data available |
| **n) Water solubility** | Insoluble |
| **o) Partition coefficient: n-octanol/water** | No data available |
| **p) Auto-ignition temperature** | No data available |
| **q) Decomposition temperature** | No data available |
| **r) Kinematic viscosity** | No data available |
| **s) Explosive properties** | No data available |
| **t) Oxidizing properties** | No data available |
| **u) Particle characteristics** | Octahedral crystals, 10–20 µm. |

**9.2 Other safety information**

No data available

SECTION 10

## Stability and Reactivity

**10.1 Reactivity**

No data available

**10.2 Chemical stability**

Stable under recommended storage conditions.

**10.3 Possibility of hazardous reactions**

No data available

**10.4 Conditions to avoid**

No data available

### 10.5 Incompatible materials

Strong bases, acids, oxidizing agents, reducing agents, alkali metals, powdered metals, acid chlorides, acid anhydrides, aldehydes, hydroxylamine, aluminum, magnesium.

### 10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions — carbon oxides, copper oxides. Other decomposition products — No data available. In the event of fire: see section 5.

SECTION 11

## Toxicological Information

### 11.1 Information on toxicological effects

Likely routes of exposure: Inhalation, ingestion, skin contact and eye contact.

**Acute toxicity**

Oral: Toxic if swallowed (Acute Tox. 3, H301).

No product-specific acute toxicity test data available.

**Skin corrosion/irritation**

Causes skin irritation (Skin Irrit. 2, H315). No product-specific test data available.

**Serious eye damage/eye irritation**

Causes serious eye irritation (Eye Irrit. 2A, H319).

No product-specific test data available.

**Respiratory or skin sensitisation**

No data available

**Germ cell mutagenicity**

No product-specific test data available.

**Carcinogenicity**

No product-specific carcinogenicity test data are available.

IARC listing status: No data available for the complete product.

NTP listing status: No data available for the complete product.

OSHA carcinogen status: No data available for the complete product.

**Reproductive toxicity**

No data available

**Specific target organ toxicity — single exposure**

No data available

**Specific target organ toxicity — repeated exposure**

No product-specific repeated-exposure toxicity test data available.

**Aspiration hazard**

No data available

**Additional information**

Toxic if swallowed. Causes skin irritation. Causes serious eye irritation.

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12

## Ecological Information

**12.1 Toxicity**

No product-specific ecotoxicity data available.

**12.2 Persistence and degradability**

No data available

**12.3 Bioaccumulative potential**

No data available

**12.4 Mobility in soil**

No data available

**12.5 Other adverse effects**

Very toxic to aquatic life with long lasting effects (Aquatic Chronic 1, H410).

SECTION 13

## Disposal Considerations

**13.1 Waste treatment methods**

**Product**

Offer surplus and non-recyclable material to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

**Contaminated packaging**

Dispose of as unused product.

SECTION 14

## Transport Information

**14.1 UN number :** ADR/RID: 2811; IMDG: 2811; IATA: 2811

**14.2 UN proper shipping name :** ADR/RID and IMDG: TOXIC SOLID, ORGANIC, N.O.S. (Copper benzene-1,3,5-tricarboxylate). IATA: Toxic solid, organic, n.o.s. (Copper benzene-1,3,5-tricarboxylate)

**14.3 Transport hazard class(es) :** ADR/RID: 6.1; IMDG: 6.1; IATA: 6.1

**14.4 Packaging group :** ADR/RID: III; IMDG: III; IATA: III

**14.5 Environmental hazards :** Very toxic to aquatic life with long lasting effects. IMDG marine pollutant: Yes.

**14.6 Special precautions for user :** No data available

SECTION 15

## Regulatory Information

**15.1 Safety, health and environmental regulations specific to the substance or mixture**

**SARA 311/312 hazard information (based on Section 2)**

Acute toxicity (any route of exposure): Category 3 (oral).

Skin corrosion or irritation: Category 2.

Serious eye damage/eye irritation: Eye irritation, Category 2A.

SECTION 16

## Other Information

**Full text of hazard statements referred to in Section 2.**

| | |
|---|---|
| **Acute Tox.** | Acute toxicity |
| **Skin Irrit.** | Skin irritation |
| **Eye Irrit.** | Eye irritation |
| **Aquatic Chronic** | Hazardous to the aquatic environment, long-term (chronic) |
| **H301** | Toxic if swallowed. |
| **H315** | Causes skin irritation. |
| **H319** | Causes serious eye irritation. |
| **H410** | Very toxic to aquatic life with long lasting effects. |

**Revision summary (1.3, 10/27/2026):** Reformatted to the current ACS Material layout. Product identification and composition information clarified. First-aid measures, storage instructions, exposure controls, physical and chemical properties, toxicological information, ecological information and regulatory information revised. HMIS and NFPA ratings removed. Section 2 hazard classes and categories unchanged; the aquatic hazard is shown as an additional GHS environmental classification not covered by OSHA HCS. Label pictograms and precautionary statements aligned with the Section 2 classification. Occupational exposure limits for copper added. Hazardous decomposition products, transport environmental-hazard entries and Section 16 hazard-statement texts aligned.

**Version 1.3 / EN · Revision Date: 10/27/2026**

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