

MATERIAL SAFETY DATA SHEET



CITRIC ACID

Drilling Fluids

1. Product and Company Identification

Material name CITRIC ACID
Synonym(s) 2-HYDROXY-1,2,3-PROPANETRICARBOXYLIC ACID
Supplier Baker Hughes Drilling Fluids
2001 Rankin Rd.
Houston, TX 77073
Emergency telephone number 713-439-8900

2. Composition / Information on Ingredients

The manufacturer lists no ingredients as hazardous according to OSHA 29 CFR 1910.1200.

3. Hazards Identification

Emergency overview Causes severe eye irritation. Irritating to respiratory system and skin. This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

OSHA regulatory status This product is considered not hazardous under 29 CFR 1910.1200 (Hazard Communication).

Potential health effects

- Eyes** Contact causes severe eye irritation. Rubbing may cause abrasion of cornea.
- Skin** Irritating to skin. Can cause redness, inflammation, irritation.
- Inhalation** Dusts of this product may cause irritation of the nose, throat, and respiratory tract. Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough.
- Ingestion** Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Chronic ingestion may result in systemic toxicity including calcium imbalance, increased pH and kidney damage.

4. First Aid Measures

First aid procedures

- Eye contact** Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
- Skin contact** Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 20 minutes. Get medical attention immediately. Wash clothing separately before reuse.
- Inhalation** Remove to fresh air. If breathing is difficult, give oxygen. Get medical attention immediately.
- Ingestion** If swallowed, and the victim is conscious and alert, induce vomiting immediately, as directed by medical personnel.

General advice If you feel unwell, seek medical advice (show the label where possible).

5. Fire Fighting Measures

Flammable properties High concentration of airborne dust may form explosive mixture with air.

Hazardous combustion products Carbon monoxide and carbon dioxide.

Extinguishing media

- Suitable extinguishing media** Dry chemical, CO₂, water spray or alcohol resistant foam.

Protection of firefighters

- Protective equipment for firefighters** Move containers from fire area if you can do it without risk. Do not scatter spilled material with high pressure water streams. As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal precautions Keep unnecessary personnel away.

Environmental precautions Prevent further leakage or spillage if safe to do so.

Methods for containment	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Stop the flow of material, if this is without risk.
Methods for cleaning up	Avoid dust formation. Vacuum or sweep up material and place in a disposal container.

7. Handling and Storage

Handling	Minimize dust generation and accumulation. Do not handle or store near an open flame, heat or other sources of ignition. Do not get this material in your eyes, on your skin, or on your clothing.
Storage	Keep away from heat and flame. Keep containers tightly closed in a dry, cool and well-ventilated place.

8. Exposure Controls / Personal Protection

Engineering controls	Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing.
Personal protective equipment	
Eye protection	Wear chemical goggles and face shield. Eye wash fountain is recommended.
Hand protection	Protective gloves.
Skin and body protection	Use of impervious boots is recommended. Use of protective coveralls and long sleeves is recommended.
Respiratory protection	When dusts or thermal processing fumes are generated and ventilation is not sufficient to effectively remove them, appropriate NIOSH/MSHA approved respiratory protection must be provided.
General hygiene considerations	When using do not smoke. Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product.

9. Physical and Chemical Properties

Appearance / Color / Form	Granular. White. Solid.
Odor	Odourless.
Clarity	Not available
Odor threshold	Not available
Physical state	Solid
pH	2.1, conc: 0.1M (solution)
Melting point	Not available
Freezing point	Not available
Boiling point	Not available
Flash point	Not available
Evaporation rate	Not available
Flammability limits in air, lower, % by volume	Not available
Flammability limits in air, upper, % by volume	Not available
Vapor pressure	Not available
Vapor density	Not available
Specific gravity	1.542
Relative density	1.542 g/cm ³
Solubility	Soluble in water
Octanol/H₂O coeff	-1.72 at 20 °C
Auto-ignition temperature	1850 °F (1010 °C)
Decomposition temperature	Not available
Molecular weight	192.13 g/mol

10. Chemical Stability & Reactivity Information

Chemical stability	Stable at normal conditions.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Metal nitrates, alkali carbonates, bicarbonates, and potassium tartrate
Hazardous decomposition products	Carbon oxides.
Possibility of hazardous reactions	Will not occur.

11. Toxicological Information

Acute effects Acute LD50: 3000 mg/kg, Rat, Oral

12. Ecological Information

Ecotoxicity None known.
Partition coefficient -1.72 at 20 °C

13. Disposal Considerations

Disposal instructions Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

14. Transport Information

Department of Transportation (DOT) Requirements

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

15. Regulatory Information

US federal regulations This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.

Occupational Safety and Health Administration (OSHA)

29 CFR 1910.1200 hazardous chemical No

CERCLA (Superfund) reportable quantity None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

Section 302 extremely hazardous substance No

Section 311 hazardous chemical Yes

Food and Drug Administration (FDA) Total food additive
GRAS food additive

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (CCS)	Yes
Europe	European Inventory of New and Existing Chemicals (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Japanese Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Korean Inventory of Chemicals (KICS)	Yes
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

Regulations The product does not need to be labelled in accordance with EC directives or respective national laws. This safety datasheet complies with the requirements of Directive 2001/58/EC.

State regulations

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

16. Other Information**HMIS® ratings**

Health: 1
Flammability: 1
Physical hazard: 0
Personal protection: C

NFPA ratings

Health: 2
Flammability: 1
Instability: 0

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.

US preparer

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