SAFETY DATA SHEET
CITRIC ACID

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name  CITRIC ACID

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

Identified uses  Oil well drilling fluid additive. pH modifier.

1.3. Details of the supplier of the safety data sheet

Supplier  M-I SWACO
A Schlumberger Company
Woodlands Drive
Kirkhill Industrial Estate
Dyce, Aberdeen AB21 0GW
Scotland UK
T=+44(0)1224-246600
F=+11(0)1224-246699
Email - MISDS@slb.com

1.4. Emergency telephone number

(24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600.

National Emergency Telephone Number
+31 (0)30-2748888 Only for the purpose of informing medical personnel in cases of acute intoxications in the Netherlands.

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical and Chemical Hazards  Not classified.
Human health  Eye Irrit. 2 - H319
Environment  Not classified.

Classification (1999/45/EEC)
Xi;R36.

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

2.2. Label elements

Label In Accordance With (EC) No. 1272/2008

Signal Word  Warning

Hazard Statements
H319  Causes serious eye irritation.

Precautionary Statements
P337+313  If eye irritation persists: Get medical advice/attention.

Supplementary Precautionary Statements
P280  Wear protective gloves/protective clothing/eye protection/face protection.
P264  Wash contaminated skin thoroughly after handling.
2.3. Other hazards
Not Classified as PBT/vPvB by current EU criteria.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

<table>
<thead>
<tr>
<th>CITRIC ACID MONOHYDRATE</th>
<th>60-100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS-No.: 5949-29-1</td>
<td>EC No.:</td>
</tr>
<tr>
<td>Classification (EC 1272/2008)</td>
<td>Eye Irrit. 2 - H319</td>
</tr>
<tr>
<td>Classification (67/548/EEC)</td>
<td>Xi;R36.</td>
</tr>
</tbody>
</table>

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Composition Comments
The data shown is in accordance with the latest EC Directives.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation
Move the exposed person to fresh air at once. If respiratory problems, artificial respiration/oxygen. Get medical attention if any discomfort continues.

Ingestion
Immediately give a couple of glasses of water or milk, provided the victim is fully conscious. Get medical attention if any discomfort continues.

Skin contact
Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention promptly if symptoms occur after washing.

Eye contact
Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention.

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

General information
The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop as described the casualty should be transferred to hospital as soon as possible. For further information, please refer to section 11.

4.3. Indication of any immediate medical attention and special treatment needed
Treat Symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Extinguishing media
Water spray, foam, dry powder or carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products
Fire or high temperatures create: Irritating gases/vapours/fumes of: Carbon monoxide (CO). Carbon dioxide (CO2).

Unusual Fire & Explosion Hazards
High concentrations of dust may form explosive mixture with air.

5.3. Advice for firefighters

Special Fire Fighting Procedures
Containers close to fire should be removed immediately or cooled with water.

Protective equipment for fire-fighters
Self contained breathing apparatus and full protective clothing must be worn in case of fire.
CITRIC ACID

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures
Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions
Do not allow to enter drains, sewers or watercourses.

6.3. Methods and material for containment and cleaning up
Avoid generation and spreading of dust. Remove spillage with vacuum cleaner. If not possible, collect spillage with shovel, broom or the like. Flush with plenty of water to clean spillage area. Do not let washing down water contaminate ponds or waterways.

6.4. Reference to other sections
For waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling
Avoid inhalation of dust and contact with skin and eyes. Avoid handling which leads to dust formation.

7.2. Conditions for safe storage, including any incompatibilities
Store in tightly closed original container in a dry, cool and well-ventilated place. Store separated from: Alkalis. Oxidising material.

Storage Class
Chemical storage.

7.3. Specific end use(s)
The identified uses for this product are detailed in Section 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Ingredient Comments
NUI = Nuisance dust, WEL TWA 4mg/m3 Respirable Dust, 10 mg/m3 Total Dust.

8.2. Exposure controls

Protective equipment

Process conditions
All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures
Provide adequate general and local exhaust ventilation.

Respiratory equipment
No specific recommendation made, but respiratory protection may still be required under exceptional circumstances when excessive air contamination exists. Wear mask supplied with: Dust filter P2 (for fine dust).

Hand protection
For prolonged or repeated skin contact use suitable protective gloves. Butyl rubber. Polyvinyl chloride (PVC).

Eye protection
Wear approved safety goggles.

Other Protection
Wear appropriate clothing to prevent any possibility of skin contact. Provide eyewash station.
SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

**Appearance**
Crystals or crystalline

**Colour**
White.

**Odour**
Odourless.

**Solubility**
Soluble in water.

**Melting point (°C)**
153°C

**Relative density**
1.542/g/cm³ @ 20°C

**Bulk Density**
900 kg/m³

**pH-Value, Diluted Solution**
1.6 @ 100g/l

**Solubility Value (G/100G H₂O@20°C)**
60

**Auto Ignition Temperature (°C)**
1010°C

9.2. Other information

Not relevant

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

Violent reaction with: Strong alkalis. Strong oxidising agents.

10.2. Chemical stability

Stable under normal temperature conditions and recommended use.

10.3. Possibility of hazardous reactions

Not known.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

**Materials To Avoid**
Strong alkalis. Strong oxidising agents.

10.6. Hazardous decomposition products

Fire or high temperatures create: Irritating gases/vapours/fumes of: Carbon monoxide (CO). Carbon dioxide (CO₂).

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

**Toxic Dose 1 - LD 50**
5040 mg/kg (oral-mouse)

**Toxic Dose 2 - LD 50**
3000 mg/kg (oral rat)

**Acute toxicity:**

**Acute Toxicity (Oral LD50)**
> 7000 mg/kg Rabbit

**ATE (Oral)**
3000 mg/kg

**Aspiration hazard:**

Not anticipated to present an aspiration hazard based on chemical structure.

**Inhalation**

Dust may irritate respiratory system or lungs.
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**Ingestion**
May irritate and cause stomach pain, vomiting and diarrhoea.

**Skin contact**
Skin irritation is not anticipated when used normally.

**Eye contact**
Causes serious eye irritation. Particles in the eyes may cause irritation and smarting.

**Route of entry**
No route of entry noted.

**Target Organs**
No specific target organs noted

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**SECTION 12: ECOLOGICAL INFORMATION**

**Ecotoxicity**
Contact M-I SWACO’s QHSE Department for ecological information at env@miswaco.slb.com.

12.1. **Toxicity**

**Acute Fish Toxicity**
Not considered toxic to fish.

*LC 50, 96 Hrs, Fish mg/l* 440 - 760

12.2. **Persistence and degradability**

**Degradability**
There are no data on the degradability of this product.

12.3. **Bioaccumulative potential**

**Bioaccumulative potential**
No data available on bioaccumulation.

12.4. **Mobility in soil**

**Mobility:**
The product is soluble in water.

12.5. **Results of PBT and vPvB assessment**

This product does not contain any PBT or vPvB substances.

12.6. **Other adverse effects**

None known.

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**SECTION 13: DISPOSAL CONSIDERATIONS**

13.1. **Waste treatment methods**

Recover and reclaim or recycle, if practical. Dispose of waste and residues in accordance with local authority requirements.

**Waste Class**
EWC-code: 06 01 06. 7134. Organic acids.

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**SECTION 14: TRANSPORT INFORMATION**

**General**
The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.1. **UN number**

Not applicable.

14.2. **UN proper shipping name**

Not applicable.
14.3. Transport hazard class(es)
Not applicable.

14.4. Packing group
Not applicable.

14.5. Environmental hazards
Environmentally Hazardous Substance/Marine Pollutant
No.

14.6. Special precautions for user
Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable. Please contact MISDS@slb.com for info regarding transport in Bulk.

SECTION 15: REGULATORY INFORMATION

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

Uk Regulatory References

EU Legislation

National Regulations
In accordance with Dutch Mining Regulation 9.2 and ARBO regulation Chapter 4.

Water hazard classification
WGK 1

15.2. Chemical Safety Assessment

International Chemical Inventories
Contact REACH@miswaco.slb.com for REACH information. Complies with the following national/regional chemical inventory requirements: Australia (AICS), Canada (DSL / NDSL), China (IECSC), Europe (EINECS / ELINCS), Japan (METI / ENCS), Korea (TCCL / ECL), New Zealand (NZIoC), Phillipines (PICCS), United States (TSCA).

SECTION 16: OTHER INFORMATION

Information Sources
Product information provided by the commercial vendor(s). Material Safety Data Sheet, Misc. manufacturers. LOLI. European Chemicals Bureau - ESIS (European Chemical Substances Information).

Revision Comments
General revision.

Issued By
Sarah Malone

Revision Date
28-Feb-13

Revision
6

Supersedes date
14-Mar-08

SDS No.
11350

Signature
Laura McDonald

Signature 2
Sandra McWilliam

Risk Phrases In Full
R36 Irritating to eyes.

Hazard Statements In Full
H319 Causes serious eye irritation.
Disclaimer

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.