

SAFETY DATA SHEET

according to Regulation (EC) No. 453/2010

CALCIUM BROMIDE 14.2 PPG

Revision Date: 01-Aug-2014

Revision Number: 16

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

1.1. Product Identifier

Product Name CALCIUM BROMIDE 14.2 PPG

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

Recommended Use Brine
Sector of use Refer to the Annex for a listing of uses.

1.3. Details of the supplier of the safety data sheet

Halliburton Manufacturing Services, Ltd.
Halliburton House, Howemoss Crescent
Kirkhill Industrial Estate
Dyce
Aberdeen, AB21 0GN
United Kingdom

Emergency Phone Number: +44 1224 795277 or +1 281 575 5000

www.halliburton.com

For further information, please contact

E-Mail address: fdunexchem@halliburton.com

1.4. Emergency telephone number

+44 1224 795277 or +1 281 575 5000

| Emergency telephone - §45 - (EC)1272/2008 | |
|---|---|
| Europe | 112 |
| Denmark | Poison Control Hotline (DK): +45 82 12 12 12 |
| France | ORFILA (FR): + 01 45 42 59 59 |
| Germany | Poison Center Berlin (DE): +49 030 30686 790 |
| Italy | Poison Center, Milan (IT): +39 02 6610 1029 |
| Netherlands | National Poisons Information Center (NL): +31 30 274 88 88 (NB: this service is only available to health professionals) |
| Norway | Poisons Information (NO):+ 47 22 591300 |
| Poland | Poison Control and Information Centre, Warsaw (PL): +48 22 619 66 54; +48 22 619 08 97 |
| Spain | Poison Information Service (ES): +34 91 562 04 20 |
| United Kingdom | NHS Direct (UK): +44 0845 46 47 |

SECTION 2: Hazards Identification

2.1. Classification of the substance or mixture

REGULATION (EC) No 1272/2008

Serious Eye Damage / Eye Irritation Category 1 - (H318)

Classification according to EU Directives 67/548/EEC or 1999/45/EC

For the full text of the R-phrases mentioned in this Section, see Section 16

Classification Xi - Irritant.

Risk Phrases R41 Risk of serious damage to eyes.

2.2. Label Elements

Hazard Pictograms



Signal Word Danger

Hazard Statements

H318 - Causes serious eye damage

Precautionary Statements - EU (§28, 1272/2008)

P280 - Wear eye protection/face protection

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310 - Immediately call a POISON CENTER or doctor/physician

Contains

Substances

Calcium bromide

CAS Number

7789-41-5

2.3. Other Hazards

None known

SECTION 3: Composition/information on Ingredients

| Substances | EINECS | CAS Number | PERCENT (w/w) | EEC Classification | EU - CLP Substance Classification | REACH No. |
|-----------------|-----------|------------|---------------|--------------------|-----------------------------------|------------------|
| Calcium bromide | 232-164-6 | 7789-41-5 | 30 - 60% | Xi; R41 | Eye Dam. 1 (H318) | 01-2119490040-51 |

For the full text of the R-phrases mentioned in this Section, see Section 16

3.1. Substances

Not applicable

3.2. Mixtures

Mixture

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation

If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Eyes

In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

Skin

Wash with soap and water. Get medical attention if irritation persists. Remove contaminated clothing and launder before reuse.

Ingestion

Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

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

May cause severe eye irritation.

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

Notes to Physician

Treat symptomatically

SECTION 5: Firefighting Measures**5.1. Extinguishing media****Suitable Extinguishing Media**

Water fog, carbon dioxide, foam, dry chemical.

Extinguishing media which must not be used for safety reasons

None known.

5.2. Special hazards arising from the substance or mixture**Special Exposure Hazards**

Decomposition in fire may produce toxic gases.

5.3. Advice for firefighters**Special Protective Equipment for Fire-Fighters**

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

SECTION 6: Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures**

Use appropriate protective equipment.

See Section 8 for additional information

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up

Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

6.4. Reference to other sections

See Section 8 and 13 for additional information.

SECTION 7: Handling and Storage**7.1. Precautions for Safe Handling**

Avoid contact with eyes, skin, or clothing. Wash hands after use.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice

7.2. Conditions for safe storage, including any incompatibilities

Store in a cool, dry location.

7.3. Specific End Use(s)**Exposure Scenario**

Please refer to the attached Annex for a listing of exposure scenarios.

Other Guidelines

No information available

SECTION 8: Exposure Controls/Personal Protection**8.1. Control parameters****Exposure Limits**

| Substances | CAS Number | EU | UK OEL | Netherlands | France OEL |
|-----------------|------------|----------------|----------------------|----------------|----------------|
| Calcium bromide | 7789-41-5 | Not applicable | 10 mg/m ³ | Not applicable | Not applicable |

| Substances | CAS Number | Germany MAK/TRK | Spain | Portugal | Finland |
|-----------------|------------|-----------------|----------------|----------------|----------------|
| Calcium bromide | 7789-41-5 | Not applicable | Not applicable | Not applicable | Not applicable |

| Substances | CAS Number | Austria | Ireland | Switzerland | Norway |
|-----------------|------------|----------------|----------------|----------------|----------------|
| Calcium bromide | 7789-41-5 | Not applicable | Not applicable | Not applicable | Not applicable |

| Substances | CAS Number | Italy | Poland | Hungary | Czech Republic |
|-----------------|------------|----------------|----------------|----------------|----------------|
| Calcium bromide | 7789-41-5 | Not applicable | Not applicable | Not applicable | Not applicable |

| Substances | CAS Number | Denmark |
|-----------------|------------|----------------|
| Calcium bromide | 7789-41-5 | Not applicable |

Derived No Effect Level (DNEL)

Worker

| Substances | Long-term exposure - systemic effects, Inhalation | Acute / short term exposure - systemic effects, Inhalation | Long-term exposure - local effects, Inhalation | Acute / short term exposure - local effects, Inhalation | Long-term exposure - systemic effects, Dermal | Acute / short term exposure - systemic effects, Dermal | Long-term exposure - local effects, Dermal | Acute / short term exposure - local effects, Dermal | Hazards for the eyes - local effects |
|-----------------|---|--|--|---|---|--|--|---|--------------------------------------|
| Calcium bromide | 1.4 mg/m ³ | Not available | Not available | 500 mg/m ³ | 0.2 mg/kg bw/d | Not available | Not available | Not available | Not available |

General Population

| Substances | Long-term exposure - systemic effects, Inhalation | Acute / short term exposure - systemic effects, Inhalation | Long-term exposure - local effects, Inhalation | Acute / short term exposure - local effects, Inhalation | Long-term exposure - systemic effects, Dermal | Acute / short term exposure - systemic effects, Dermal | Long-term exposure - local effects, Dermal | Acute / short term exposure - local effects, Dermal | Long-term exposure - systemic effects, Oral | Acute / short term exposure - local effects, Oral | Hazards for the eyes - local effects |
|-----------------|---|--|--|---|---|--|--|---|---|---|--------------------------------------|
| Calcium bromide | 0.25 mg/m ³ | Not available | Not available | Not available | 0.073 mg/kg bw/d | Not available | Not available | Not available | 0.073 mg/kg bw/d | Not available | Not available |

Predicted No Effect Concentration (PNEC)

| Substances | Freshwater | Marine water | Intermittent release | Sewage treatment plant | Sediment (freshwater) | Sediment (marine water) | Air | Soil | Secondary poisoning |
|-----------------|------------|--------------|----------------------|------------------------|-------------------------|-------------------------|---------------|-------------------|----------------------------------|
| Calcium bromide | 0.117 mg/L | 0.058 mg/L | 0.208 mg/L | 77.7 mg/L | 0.433 mg/kg sediment dw | 0.215 mg/kg sediment dw | Not available | 0.2 mg/kg soil dw | No potential for bioaccumulation |

8.2. Exposure controls

Engineering Controls

Use in a well ventilated area.

Personal protective equipment

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection

If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional. Dust/mist respirator. (N95, P2/P3)

Hand Protection

Chemical-resistant protective gloves (EN 374) Suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes permeation time as per EN 374): Butyl rubber gloves. (>= 0.7 mm thickness)

This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances. Please note that in practice the working life of chemical-resistant protective gloves may be considerably shorter than the permeation time determined in accordance with EN 374 as a result of the many influencing factors (e.g. temperature). If signs of wear and tear are noticed then the gloves should be replaced. Manufacturer's directions for use should be observed because of great diversity of types.

Skin Protection

Normal work coveralls.

Eye Protection

Chemical goggles; also wear a face shield if splashing hazard exists.

Other Precautions

Eyewash fountains and safety showers must be easily accessible.

Environmental Exposure Controls No information available

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Liquid

Color: Clear colorless to pale yellow

Odor: Odorless

Odor Threshold: No information available

| <u>Property</u> Remarks/ - Method | <u>Values</u> |
|---|--------------------------|
| pH: | 7 |
| Freezing Point/Range | < -7 °C |
| Melting Point/Range | No data available |
| Boiling Point/Range | 130 °C |
| Flash Point | No data available |
| Evaporation rate | No data available |
| Vapor Pressure | 10 mmHg |
| Vapor Density | No data available |
| Specific Gravity | 1.7 |
| Water Solubility | Soluble in water |
| Solubility in other solvents | No data available |
| Partition coefficient: n-octanol/water | No data available |
| Autoignition Temperature | No data available |
| Decomposition Temperature | No data available |
| Viscosity | No data available |
| Explosive Properties | No information available |
| Oxidizing Properties | No information available |

9.2. Other information

VOC Content (%) No data available

SECTION 10: Stability and Reactivity

10.1. Reactivity

Not applicable

10.2. Chemical Stability

Stable

10.3. Possibility of Hazardous Reactions

Will Not Occur

10.4. Conditions to Avoid

None anticipated

10.5. Incompatible Materials

Contact with water. Potassium.

10.6. Hazardous Decomposition Products

Hydrogen bromide.

SECTION 11: Toxicological Information

11.1. Information on Toxicological Effects

Acute Toxicity

| | |
|---------------------|---|
| Inhalation | May cause respiratory irritation. |
| Eye Contact | May cause severe eye irritation. |
| Skin Contact | May cause skin irritation. |
| Ingestion | Irritation of the mouth, throat, and stomach. |

Chronic Effects/Carcinogenicity No data available to indicate product or components present at greater than 1% are chronic health hazards.

Toxicology data for the components

| Substances | CAS Number | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|-----------------|------------|--------------------------------------|----------------------|---|
| Calcium bromide | 7789-41-5 | 2447 mg/kg (Rat) 2210 mg/kg (Rat) | >2000 mg/kg (Rabbit) | > 203 mg/L (Rat, aerosol, 1h) > 204 mg/L (Rat, dust, 1h) |

| Substances | CAS Number | Skin corrosion/irritation |
|-----------------|------------|-------------------------------------|
| Calcium bromide | 7789-41-5 | Non-irritating to the skin (rabbit) |

| Substances | CAS Number | Eye damage/irritation |
|-----------------|------------|---------------------------------------|
| Calcium bromide | 7789-41-5 | Causes severe eye irritation (rabbit) |

| Substances | CAS Number | Skin Sensitization |
|-----------------|------------|--|
| Calcium bromide | 7789-41-5 | Did not cause sensitization on laboratory animals (guinea pig) |

| Substances | CAS Number | Respiratory Sensitization |
|-----------------|------------|---------------------------|
| Calcium bromide | 7789-41-5 | No information available |

| Substances | CAS Number | Mutagenic Effects |
|-----------------|------------|---|
| Calcium bromide | 7789-41-5 | In vitro tests did not show mutagenic effects |

| Substances | CAS Number | Carcinogenic Effects |
|-----------------|------------|--|
| Calcium bromide | 7789-41-5 | Did not show carcinogenic effects in animal experiments (similar substances) |

| Substances | CAS Number | Reproductive toxicity |
|-----------------|------------|--|
| Calcium bromide | 7789-41-5 | Animal testing did not show any effects on fertility. Adverse developmental effects were only observed at maternally toxic doses. (similar substances) |

| Substances | CAS Number | STOT - single exposure |
|-----------------|------------|---|
| Calcium bromide | 7789-41-5 | No significant toxicity observed in animal studies at concentration requiring classification. |

| Substances | CAS Number | STOT - repeated exposure |
|-----------------|------------|--------------------------|
| Calcium bromide | 7789-41-5 | No information available |

| Substances | CAS Number | Aspiration hazard |
|-----------------|------------|-------------------|
| Calcium bromide | 7789-41-5 | Not applicable |

SECTION 12: Ecological Information

12.1. Toxicity Ecotoxicity Effects

| Substances | CAS Number | Toxicity to Algae | Toxicity to Fish | Toxicity to Microorganisms | Toxicity to Invertebrates |
|-----------------|------------|--|---|--|---|
| Calcium bromide | 7789-41-5 | EC50(48h): > 440 mg/L (Growth rate) (Skeletonema costatum) (similar substance) | LC50(96h): > 440 mg/L (Scophthalmus maximus) (similar substance) LC50(96h): > 1000 mg/L (Lepomis macrochirus) (similar substance) NOEC(124d): 10 mg/L (Poecelia reticulata) (similar substance) | EC50(3h): > 1000 mg/L (activated sludge, domestic) (similar substance) | EC50(48h): > 100 mg/L (Daphnia magna) NOEC(21d): 7.5 mg/L (Reproduction) (Daphnia magna) (similar substance) |

12.2. Persistence and degradability

The methods for determining biodegradability are not applicable to inorganic substances.

| Substances | CAS Number | Persistence and Degradability |
|-----------------|------------|--|
| Calcium bromide | 7789-41-5 | The methods for determining biodegradability are not applicable to inorganic substances. |

12.3. Bioaccumulative potential

Does not bioaccumulate

| Substances | CAS Number | Log Pow |
|-----------------|------------|--------------------------|
| Calcium bromide | 7789-41-5 | No information available |

12.4. Mobility in soil

No information available

12.5. Results of PBT and vPvB assessment

This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).

12.6. Other adverse effects

Endocrine Disruptor Information

This product does not contain any known or suspected endocrine disruptors

SECTION 13: Disposal Considerations

13.1. Waste treatment methods

Disposal Method

Disposal should be made in accordance with federal, state, and local regulations.

Contaminated Packaging

Follow all applicable national or local regulations.

SECTION 14: Transport Information

IMDG/IMO

UN Number: Not restricted.
UN Proper Shipping Name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

RID

UN Number: Not restricted.
UN Proper Shipping Name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental hazard: Not applicable

ADR

UN Number: Not restricted.
UN Proper Shipping Name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental hazard: Not applicable

IATA/ICAO

UN Number: Not restricted.
UN Proper Shipping Name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental hazard: Not applicable

14.1. UN Number: Not restricted.

14.2. UN Proper Shipping Name: Not restricted

14.3. Transport Hazard Class(es): Not applicable

14.4. Packing Group: Not applicable

14.5. Environmental Hazards: Not applicable

14.6. Special Precautions for User: None

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

SECTION 15: Regulatory Information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**International Inventories****EINECS Inventory**

This product, and all its components, complies with EINECS

US TSCA Inventory

All components listed on inventory or are exempt.

Canadian DSL Inventory

All components listed on inventory or are exempt.

Legend**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory**EINECS/ELINCS** - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List**Germany, Water Endangering
Classes (WGK)**

WGK 1: Low hazard to waters.

15.2. Chemical Safety Assessment

Yes

SECTION 16: Other Information**Full text of R-phrases referred to under Sections 2 and 3**

Xi - Irritant.

R41 Risk of serious damage to eyes.

Key literature references and sources for datawww.ChemADVISOR.com/**Revision Date:**

01-Aug-2014

Revision Note

Update to Format SECTION: 8

This safety data sheet complies with the requirements of Regulation (EC) No. 453/2010**Disclaimer Statement**

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End of Safety Data Sheet