HALLIBURTON

SAFETY DATA SHEET

according to Regulation (EC) No. 453/2010

CLLAU301

Revision Date: 07-Sep-2015 **Revision Number:** 10

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

1.1. Product Identifier

Product Name CLLAU301
Internal ID Code HM007420

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

Recommended Use Crosslinker
Sector of use SU2 - Mining, (including offshore industries)
Product category PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents, other unspecific
Process categories PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises

1.3. Details of the supplier of the safety data sheet

Halliburton Energy Services
Halliburton House, Howemoss Place
Kirkhill Industrial Estate
Dyce
Aberdeen, AB21 0GN
United Kingdom

www.halliburton.com

For further information, please contact
E-Mail address: fdunexchem@halliburton.com

1.4. Emergency telephone number

+44 8 08 189 0979 / 1-760-476-3961

Emergency telephone - §45 - (EC)1272/2008	
Europe	**112**
Croatia	Centar za kontrolu otrovanja (CKO): (+385 1) 23-48-342 (Poison Control Center (PCC) - Institute for Medical Research and Occupational Health)
Cyprus	+210 7793777
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
Romania	+40 21 318 36 06
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
Carcinogenicity	Category 2 - H351

2.2. Label Elements

Hazard Pictograms

Signal Word **Danger**

Hazard Statements
H318 - Causes serious eye damage
H351 - Suspected of causing cancer

Precautionary Statements - EU (§28, 1272/2008)
P202 - Do not handle until all safety precautions have been read and understood
P280 - Wear protective gloves/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
P308 + P313 - IF exposed or concerned: Get medical advice/attention
P405 - Store locked up
P501 - Dispose of contents/container to an approved waste disposal plant

Contains

Substances	**CAS Number**
Aluminum sulfate	10043-01-3
Sulfuric acid	7664-93-9

2.3. Other Hazards

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

SECTION 3: Composition/information on Ingredients

3.2. Mixtures

Mixture

Substances	EINECS	CAS Number	PERCENT (w/w)	EU - CLP Substance Classification	REACH No.
Aluminum sulfate	233-135-0	10043-01-3	5 - 10%	Eye Corr. 1 (H318) Aquatic Chronic 3 (H412) Met. Corr. 1 (H290)	No data available
Sulfuric acid	231-639-5	7664-93-9	1 - 5%	Skin Corr. 1A (H314) Eye Corr. 1 (H318) Carc. 2 (H351) STOT SE 3 (H335) Met. Corr. 1 (H290)	No data available

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

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 Immediately flush eyes with large amounts of water for at least 15 minutes. Get immediate medical attention.

Skin Wash with soap and water. Get medical attention if irritation persists.

Ingestion Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

4.2. Most Important symptoms and effects, both acute and delayed
Causes serious eye damage. Potential carcinogen. May cause skin and respiratory 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
All standard fire fighting media
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
Not applicable.

5.3. Advice for firefighters
Special Protective Equipment for Fire-Fighters
Not applicable.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Use appropriate protective equipment. Avoid contact with skin, eyes and clothing. Avoid breathing vapors. Ensure adequate ventilation.
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. Neutralize with lime slurry, limestone, or soda ash. 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. Avoid breathing mist. Avoid breathing vapors. Ensure adequate ventilation. Use appropriate protective equipment.
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. Product has a shelf life of 24 months.

7.3. Specific End Use(s)
Exposure Scenario No information available
Other Guidelines No information available

SECTION 8: Exposure Controls/Personal Protection

8.1. Control parameters
Exposure Limits

Substances	CAS Number	EU	UK	Netherlands	France
Aluminum sulfate	10043-01-3	Not applicable	2 mg/m³	2 mg/m³	Not applicable
Sulfuric acid	7664-93-9	Not applicable	0.3 mg/m³	0.05 mg/m³	1 mg/m³

Substances	CAS Number	Germany	Spain	Portugal	Finland
Aluminum sulfate	10043-01-3	Not applicable	TWA: 2 mg/m³	TWA: 2 mg/m³	TWA: 1 mg/m³
Sulfuric acid	7664-93-9	TWA: 0.1 mg/m³	TWA: 0.05 mg/m³	TWA: 0.05 mg/m³	TWA: 0.05 mg/m³ STEL: 0.1 mg/m³

Substances	CAS Number	Austria	Ireland	Switzerland	Norway
Aluminum sulfate	10043-01-3	Not applicable	2 mg/m³ TWA	Not applicable	TWA: 2 mg/m³ STEL: 4 mg/m³
Sulfuric acid	7664-93-9	TWA: 0.1 mg/m³ STEL" 0.2 mg/m³	0.05 ppm TWA 0.15 ppm STEL (calculated)	TWA: 0.1 mg/m³ STEL: 0.1 mg/m³	TWA: 0.1 mg/m³ STEL: 0.3 mg/m³

Substances	CAS Number	Italy	Poland	Hungary	Czech Republic
Aluminum sulfate	10043-01-3	Not applicable	Not applicable	Not applicable	Not applicable
Sulfuric acid	7664-93-9	Not applicable	TWA: 1 mg/m³ TWA: 0.05 mg/m³ STEL: 3 mg/m³	TWA: 1 mg/m³ STEL: 1 mg/m³	TWA: 1 mg/m³ TWA: 0.05 mg/m³

Substances	CAS Number	Denmark	Romania	Croatia	Cyprus
Aluminum sulfate	10043-01-3	TWA: 1 mg/m³	Not applicable	Not applicable	Not applicable
Sulfuric acid	7664-93-9	TWA: 0.05 mg/m³	TWA: 0.05 mg/m³	TWA: 0.05 mg/m³	TWA: 0.05 mg/m³

Derived No Effect Level (DNEL) No information available.

Worker

General Population

Predicted No Effect Concentration (PNEC) No information available.

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 Wear safety glasses or goggles to protect against exposure.

Other Precautions None known.

Environmental Exposure Controls Do not allow material to contaminate ground water system

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Liquid **Color:** White

Odor: Odorless **Odor Threshold:** No information available

Property	Values	Remarks/ - Method
pH:	0.80	

Freezing Point/Range	No data available
Melting Point/Range	No data available
Boiling Point/Range	No data available
Flash Point	No data available
Flammability (solid, gas)	No data available
upper flammability limit	No data available
lower flammability limit	No data available
Evaporation rate	No data available
Vapor Pressure	No data available
Vapor Density	No data available
Specific Gravity	1.01
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 expected to be reactive.

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

Strong alkalis.

10.6. Hazardous Decomposition Products

Oxides of sulfur.

SECTION 11: Toxicological Information

11.1. Information on Toxicological Effects

Acute Toxicity

Inhalation	May cause respiratory irritation.
Eye Contact	Causes serious eye damage.
Skin Contact	May cause skin irritation.
Ingestion	In large amounts: May cause abdominal pain, vomiting, nausea, and diarrhea.

Chronic Effects/Carcinogenicity Contains sulfuric acid, a potential carcinogen.

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Aluminum sulfate	10043-01-3	1930 mg/kg (Rat) 2000 - 5000 mg/kg (Rat)	> 5000 mg/kg (Rabbit)	>6.1 mg/L (Rat, aerosol) 4h (Similar substance)
Sulfuric acid	7664-93-9	2140 mg/kg (Rat)	No data available	347 ppm (Rat) 1h 510 mg/m³ (Rat) 2h 295 mg/m³ (Rat) 4h 375 mg/m³ (Rat) 4h 160 mg/m³ (Mouse) 4h 15 mg/m³ (Guinea pig) 4h 9 mg/m³ (Guinea pig) 4h

Substances	CAS Number	Skin corrosion/irritation
Aluminum sulfate	10043-01-3	Non-irritating to the skin (Rabbit)
Sulfuric acid	7664-93-9	Causes severe burns

Substances	CAS Number	Eye damage/irritation
Aluminum sulfate	10043-01-3	Causes severe eye irritation. (Rabbit)
Sulfuric acid	7664-93-9	Causes serious eye damage

Substances	CAS Number	Skin Sensitization
Aluminum sulfate	10043-01-3	Not regarded as a sensitizer.
Sulfuric acid	7664-93-9	Not regarded as a sensitizer.

Substances	CAS Number	Respiratory Sensitization
Aluminum sulfate	10043-01-3	No information available
Sulfuric acid	7664-93-9	No information available

Substances	CAS Number	Mutagenic Effects
Aluminum sulfate	10043-01-3	Not regarded as mutagenic.
Sulfuric acid	7664-93-9	Not regarded as mutagenic.

Substances	CAS Number	Carcinogenic Effects
Aluminum sulfate	10043-01-3	No information available.
Sulfuric acid	7664-93-9	This substance is a potential carcinogen.

Substances	CAS Number	Reproductive toxicity
Aluminum sulfate	10043-01-3	No data of sufficient quality are available.
Sulfuric acid	7664-93-9	Did not show teratogenic effects in animal experiments.

Substances	CAS Number	STOT - single exposure
Aluminum sulfate	10043-01-3	No information available
Sulfuric acid	7664-93-9	May cause respiratory irritation.

Substances	CAS Number	STOT - repeated exposure
Aluminum sulfate	10043-01-3	No data of sufficient quality are available.
Sulfuric acid	7664-93-9	Not applicable due to corrosivity of the substance.

Substances	CAS Number	Aspiration hazard
Aluminum sulfate	10043-01-3	Not applicable
Sulfuric acid	7664-93-9	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
Aluminum sulfate	10043-01-3	EC50 (72h) 14 mg/L (growth rate) (Pseudokirchnerella subcapitata)	LC50 100 mg/L (Carassius auratus) LC50 (96h) 186 mg/L (Danio rerio) LC50 (42d) 15 ug/L (dissolved Aluminium) (Salmo trutta) NOEC (60d) 26 ug/L (mortality in Fry) (Salvelinus fontinalis) LC50 (96h) 104 mg/L (Danio rerio) (similar substance)	EC50 (3d) > 1000 mg/L (activated sludge)	EC50 (48h) 136 mg/L (Daphnia magna) EC50 (48h) > 200 mg/L (Daphnia magna) EC50 (48h) 38 mg/L (similar substance) NOEC (8d) 3.8 mg/L (reproduction) (Ceriodaphnia dubia) (Similar substance)
Sulfuric acid	7664-93-9	ErC50 (72h) > 100 mg/L (Desmodesmus subspicatus)	LC50 (96h) > 500 mg/l (Danio rerio) LC50 (96h) 16-28 mg/L (Lepomis macrochirus)	NOEC (21d) 6.61 pH (total bacteria) NOEC (37d) ~ 26000 mg/L (Activated sludge,	EC50 (48h) 29 mg/L (Daphnia magna) EC50 (48h) > 100 mg/L (Daphnia magna)

			LC50 (96h) 42 mg/L (Gambusia affinis) NOEC (65d) 0.025 mg/L (fry growth) (Jordanella floridae) NOEC 0.31 mg/L (larval development) (Salvelinus fontinalis)	respiration rate) (Similar substance)	NOEL 0.15 mg/L (mortality) (Tanytarsus dissimilis) EC50 (24h) 29 mg/L (Daphnia magna) EC50 (48h) 42.5 mg/L (Pandalus montagui)

12.2. Persistence and degradability

Substances	CAS Number	Persistence and Degradability
Aluminum sulfate	10043-01-3	The methods for determining biodegradability are not applicable to inorganic substances.
Sulfuric acid	7664-93-9	The methods for determining biodegradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

Does not bioaccumulate

Substances	CAS Number	Log Pow
Aluminum sulfate	10043-01-3	No information available
Sulfuric acid	7664-93-9	No information available

12.4. Mobility in soil

Substances	CAS Number	Mobility
Aluminum sulfate	10043-01-3	No information available
Sulfuric acid	7664-93-9	No information available

12.5. Results of PBT and vPvB assessment

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

Substances	PBT and vPvB assessment
Aluminum sulfate	Not PBT/vPvB
Sulfuric acid	Not PBT/vPvB

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 Hazards: Not applicable

ADR

UN Number: Not restricted
UN Proper Shipping Name: Not restricted

Transport Hazard Class(es):	Not applicable
Packing Group:	Not applicable
Environmental Hazards:	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 Hazards:	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
No information available

SECTION 16: Other Information

Full text of H-Statements referred to under sections 2 and 3
H290 - May be corrosive to metals
H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage
H335 - May cause respiratory irritation
H351 - Suspected of causing cancer
H412 - Harmful to aquatic life with long lasting effects

Key or legend to abbreviations and acronyms
bw – body weight
CAS – Chemical Abstracts Service
CLP – REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Classification, Labelling and Packaging of substances and mixtures
EC – European Commission
EC10 – Effective Concentration 10%
EC50 – Effective Concentration 50%
EEC – European Economic Community
ErC50 – Effective Concentration growth rate 50%
IBC Code – International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
LC50 – Lethal Concentration 50%

LD50 – Lethal Dose 50%
LL0 – Lethal Loading 0%
LL50 – Lethal Loading 50%
MARPOL – International Convention for the Prevention of Pollution from Ships
mg/kg – milligram/kilogram
mg/L – milligram/liter
NIOSH – National Institute for Occupational Safety and Health
NOEC – No Observed Effect Concentration
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PBT – Persistent Bioaccumulative and Toxic
PC – Chemical Product category
PEL – Permissible Exposure Limit
ppm – parts per million
PROC – Process category
REACH – REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals
STEL – Short Term Exposure Limit
SU – Sector of Use category

Key literature references and sources for data
www.ChemADVISOR.com/

Revision Date: 07-Sep-2015
Revision Note
SDS sections updated: 1

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

Disclaimer Statement
This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Safety Data Sheet