HALLIBURTON

SAFETY DATA SHEET

according to Regulation (EC) No. 453/2010

SANDSTONE COMPLETION ACID

Revision Date: 12-May-2014 **Revision Number:** 6

1. Identification of the substance/mixture and of the company/undertaking

1.1 Product Identifier

Product Name SANDSTONE COMPLETION ACID

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

Recommended Use	Acid
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

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

2. Hazards Identification

2.1 Classification of the substance or mixture

REGULATION (EC) No 1272/2008

Acute Oral Toxicity	Category 2 - H300
Acute Toxicity - Dermal	Category 2 - H310
Acute Inhalation Toxicity - Dusts and Mists	Category 2 - H330

Skin Corrosion / irritation	Category 1 - H314
Serious Eye Damage / Eye Irritation	Category 1 - H318
Specific Target Organ Toxicity - (Single Exposure)	Category 3 - H335

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
T - Toxic.
C - Corrosive.

Risk Phrases
R34 Causes burns.
R37 Irritating to respiratory system.
R23/24/25 Toxic by inhalation, by contact with skin, and if swallowed.

2.2 Label Elements

Hazard Pictograms

Signal Word **Danger**

Hazard Statements
H300 - Fatal if swallowed
H310 - Fatal in contact with skin
H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage
H330 - Fatal if inhaled
H335 - May cause respiratory irritation

Precautionary Statements - EU (§28, 1272/2008)
P280 - Wear protective gloves/eye protection/face protection
P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P310 - Immediately call a POISON CENTER or doctor/physician
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

Contains

Substances	**CAS Number**
Hydrochloric acid	7647-01-0
Hydroxyacetic acid	79-14-1
Hydrofluoric acid	7664-39-3

2.3 Other Hazards
None known

3. Composition/information on Ingredients

Substances	EINECS	CAS Number	PERCENT (w/w)	EEC Classification	EU - CLP Substance Classification	REACH No.
Hydrochloric acid	231-595-7	7647-01-0	10 - 30%	C; R34 Xi; R37	Skin Corr. 1B (H314) Eye Dam. 1 (H318) STOT SE 3 (H335) Met. Corr. 1 (H290)	01-2119484862-27

Hydroxyacetic acid	201-180-5	79-14-1	1 - 5%	C; R34 Xn; R20	Skin Corr. 1B (H314) Eye Dam. 1 (H318) Acute Tox. 4 (H332)	No data available
Hydrofluoric acid	231-634-8	7664-39-3	1 - 5%	T+; R26/27/28 C; R35	Acute Tox. 2 (H300) Acute Tox. 1 (H310) Acute Tox. 2 (H330) Skin Corr. 1A (H314)	No data available

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

4. First aid measures

4.1 Description of first aid measures

Inhalation If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.

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 In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention. Remove contaminated clothing and launder before reuse. Wearing protective gloves, apply 2.5% calcium gluconate gel at burn site rubbing continuously.

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 eye, skin, and respiratory burns. May be absorbed through the skin. May be harmful if swallowed. May be harmful if inhaled

4.3 Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically

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

Decomposition in fire may produce toxic gases. Reaction with steel and certain other metals generates flammable hydrogen gas. Do not allow runoff to enter waterways.

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.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Wear full protective gear. Reaction can be violent and harmful vapors may be released. 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. Neutralize to pH of 6-8. Scoop up and remove.

6.4 Reference to other sections

See Section 8 and 13 for additional information.

7. Handling and Storage

7.1 Precautions for Safe Handling

Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice

7.2 Conditions for safe storage, including any incompatibilities

Store away from alkalis. Store in a cool well ventilated area. Keep container closed when not in use. Do not store in containers made of fiberglass.

7.3 Specific End Use(s)

Exposure Scenario No information available

Other Guidelines No information available

8. Exposure Controls/Personal Protection

8.1 Control parameters

Exposure Limits

Substances	CAS Number	EU	UK OEL	Netherlands	France OEL
Hydrochloric acid	7647-01-0	Not applicable	STEL: 5 ppm STEL: 8 mg/m³ TWA: 1 ppm TWA: 2 mg/m³	TWA: 8 mg/m³ STEL: 15 mg/m³	Not applicable
Hydroxyacetic acid	79-14-1	Not applicable	Not applicable	Not applicable	Not applicable
Hydrofluoric acid	7664-39-3	Not applicable	STEL: 3 ppm STEL: 2.5 mg/m³ TWA: 1.8 ppm TWA: 1.5 mg/m³	STEL: 1 mg/m³	1.8 ppm

Substances	CAS Number	Germany MAK/TRK	Spain	Portugal	Finland
Hydrochloric acid	7647-01-0	TWA: 2 ppm TWA: 3 mg/m³ MAK: 2 ppm MAK: 3.0 mg/m³	10 ppm VLA-EC; 15 mg/m³ VLA-EC VLA-ED: 5 ppm VLA-ED: 7.6 mg/m³	Not applicable	STEL: 5 ppm STEL: 7.6 mg/m³
Hydroxyacetic acid	79-14-1	Not applicable	Not applicable	Not applicable	Not applicable
Hydrofluoric acid	7664-39-3	TWA: 1 ppm TWA: 0.83 mg/m³ MAK: 1 ppm MAK: 0.83 mg/m³	3 ppm VLA-EC; 2.5 mg/m³ VLA-EC VLA-ED: 1.8 ppm VLA-ED: 1.5 mg/m³	TWA: 0.5 ppm	STEL: 3 ppm STEL: 2.5 mg/m³ TWA: 1.8 ppm TWA: 1.5 mg/m³

Substances	CAS Number	Austria	Ireland	Switzerland	Norway
Hydrochloric acid	7647-01-0	Not applicable	Not applicable	Not applicable	Not applicable
Hydroxyacetic acid	79-14-1	Not applicable	Not applicable	Not applicable	Not applicable
Hydrofluoric acid	7664-39-3	Not applicable	Not applicable	Not applicable	STEL: 2.4 ppm STEL: 1.8 mg/m³ TWA: 0.8 ppm TWA: 0.6 mg/m³

Substances	CAS Number	Italy	Poland	Hungary	Czech Republic
Hydrochloric acid	7647-01-0	STEL: 10 ppm STEL: 15 mg/m³ TWA: 5 ppm TWA: 8 mg/m³	NDSCh: 10 mg/m³ NDS: 5 mg/m³	TWA: 8 mg/m³ STEL: 16 mg/m³	TWA: 8 mg/m³
Hydroxyacetic acid	79-14-1	Not applicable	Not applicable	Not applicable	Not applicable
Hydrofluoric acid	7664-39-3	STEL: 3 ppm STEL: 2.5 mg/m³ TWA: 1.8 ppm TWA: 1.5 mg/m³	NDSCh: 2 mg/m³ NDS: 0.5 mg/m³	TWA: 1.5 mg/m³ STEL: 2.5 mg/m³	TWA: 1.5 mg/m³

Substances	CAS Number	Denmark
Hydrochloric acid	7647-01-0	Not applicable
Hydroxyacetic acid	79-14-1	Not applicable
Hydrofluoric acid	7664-39-3	TWA: 1.8 ppm TWA: 1.5 mg/m³

Derived No Effect Level (DNEL) No information available.

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
Hydrochloric acid	Not available	Not available	8 mg/m³	15 mg/m³	Not available	Not available	Not available	Not available	Not available

General Population

Predicted No Effect Concentration (PNEC) No information available.

Substances	Freshwater	Marine water	Intermittent release	Sewage treatment plant	Sediment (freshwater)	Sediment (marine water)	Air	Soil	Secondary poisoning
Hydrochloric acid	36 ug/L	36 ug/L	45 ug/L	36 ug/L	Not available	Not available	Not available	Not available	Not available

8.2 Exposure controls

Engineering Controls Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.

Personal protective equipment

Respiratory Protection Acid gas respirator.

Hand Protection Impervious rubber gloves.

Skin Protection Full protective chemical resistant clothing. Rubber boots.

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

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Physical State: Liquid **Color:** Clear colorless

Odor: Pungent irritating **Odor Threshold:** No information available

Property Remarks/ - Method	Values
pH:	0.5
Freezing Point/Range	No data available
Melting Point/Range	No data available
Boiling Point/Range	No data available
Flash Point	No data available
Evaporation rate	No data available
Vapor Pressure	No data available
Vapor Density	No data available
Specific Gravity	1.09
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

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
Silicone bearing materials. Strong alkalis. Contact with metals.
10.6 Hazardous Decomposition Products
Flammable hydrogen gas. Chlorine. Hydrogen fluoride. Hydrogen sulfide.

11. Toxicological Information

11.1 Information on Toxicological Effects

Acute Toxicity

Inhalation May cause lungs to fill with fluids. Causes severe respiratory burns.

Eye Contact Causes eye burns.

Skin Contact Effects on skin may be delayed for 24-48 hours. Harmful if absorbed through the skin. Causes skin burns which may not be immediately painful or visible.

Ingestion May cause damage to bones and teeth. Causes burns of the mouth, throat and stomach.

Chronic Effects/Carcinogenicity Prolonged or repeated exposure may result in fluorosis. Symptoms include nausea, vomiting, loss of appetite, diarrhea, and/or constipation. Fluorosis also results in bone density increase. Prolonged, excessive exposure may cause erosion of the teeth.

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Hydrochloric acid	7647-01-0	No data available	5010 mg/kg (Rabbit) >5010 mg/kg (Rabbit) 1449 mg/kg (Mouse)	3124 ppm (Rat) 1 h 3.2 mg/L (Mouse) 8.3 mg/L (aerosol, Rat) 1405 ppm (Rat) 554 ppm (Mouse)
Hydroxyacetic acid	79-14-1	1950 mg/kg (Rat)	No data available	7.7 mg/L (Rat) 4 h
Hydrofluoric acid	7664-39-3	No data available	No data available	1276 ppm (Rat) 1 h 850 mg/m³ (Rat) 1 h

Substances	CAS Number	Skin corrosion/irritation
Hydrochloric acid	7647-01-0	Causes severe burns
Hydroxyacetic acid	79-14-1	Corrosive to skin
Hydrofluoric acid	7664-39-3	Corrosive to skin (rabbit)

Substances	CAS Number	Eye damage/irritation
Hydrochloric acid	7647-01-0	Causes severe burns
Hydroxyacetic acid	79-14-1	Corrosive to eyes
Hydrofluoric acid	7664-39-3	Corrosive to eyes (rabbit)

Substances	CAS Number	Skin Sensitization
Hydrochloric acid	7647-01-0	Did not cause sensitization on laboratory animals (guinea pig)
Hydroxyacetic acid	79-14-1	Did not cause sensitization on laboratory animals (guinea pig)
Hydrofluoric acid	7664-39-3	Not applicable due to corrosivity of the substance.

Substances	CAS Number	Respiratory Sensitization
Hydrochloric acid	7647-01-0	No information available
Hydroxyacetic acid	79-14-1	No information available
Hydrofluoric acid	7664-39-3	No information available

Substances	CAS Number	Mutagenic Effects
Hydrochloric acid	7647-01-0	Not regarded as mutagenic.
Hydroxyacetic acid	79-14-1	Not regarded as mutagenic.
Hydrofluoric acid	7664-39-3	Not regarded as mutagenic.

Substances	CAS Number	Carcinogenic Effects
Hydrochloric acid	7647-01-0	Did not show carcinogenic effects in animal experiments
Hydroxyacetic acid	79-14-1	No information available.
Hydrofluoric acid	7664-39-3	Did not show carcinogenic effects in animal experiments

Substances	CAS Number	Reproductive toxicity
Hydrochloric acid	7647-01-0	Embryo and fetotoxicity has been observed in female rats exposed to maternally toxic levels of hydrogen chloride (450 mg/m^3, 1hr.).
Hydroxyacetic acid	79-14-1	Not a confirmed reproductive toxicant.
Hydrofluoric acid	7664-39-3	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments. (similar substances)

Substances	CAS Number	STOT - single exposure
Hydrochloric acid	7647-01-0	Causes severe respiratory irritation.
Hydroxyacetic acid	79-14-1	Causes severe respiratory irritation.
Hydrofluoric acid	7664-39-3	Causes severe respiratory irritation.

Substances	CAS Number	STOT - repeated exposure
Hydrochloric acid	7647-01-0	No significant toxicity observed in animal studies at concentration requiring classification.
Hydroxyacetic acid	79-14-1	Not classified
Hydrofluoric acid	7664-39-3	No significant toxicity observed in animal studies at concentration requiring classification.

Substances	CAS Number	Aspiration hazard
Hydrochloric acid	7647-01-0	Not applicable
Hydroxyacetic acid	79-14-1	Not applicable
Hydrofluoric acid	7664-39-3	Not applicable

12. Ecological Information

12.1 Toxicity

Ecotoxicity Effects

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Hydrochloric acid	7647-01-0	EC50: 4.7 (pH) (Chlorella vulgaris) 72 h	LC50: 282 mg/L (Gambusia affinis) LC50: 20.5 mg/L (Lepomis macrochirus) LC50: 3.25 – 3.5 (pH) (Lepomis macrochirus) 96 h	EC50(3h): >= 5 and <= 5.5 (pH) (Activated sludge, domestic)	EC50: 4.9 (pH) (Daphnia magna) 48 h
Hydroxyacetic acid	79-14-1	No information available	LC50: > 5000 mg/L (Brachydanio rerio)	No information available	No information available
Hydrofluoric acid	7664-39-3	EC50(96h): 122 mg/L (Selenastrum capricornutum)	EC50(96h): 51 mg/L (Oncorhynchus mykiss)	No information available	EC50(48h): 26.48 mg/L (Daphnia magna)

12.2 Persistence and degradability

Substances	CAS Number	Persistence and Degradability
Hydrochloric acid	7647-01-0	The methods for determining biodegradability are not applicable to inorganic substances.
Hydroxyacetic acid	79-14-1	No information available
Hydrofluoric acid	7664-39-3	The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

Substances	CAS Number	Log Pow

Hydrochloric acid	7647-01-0	0.25
Hydroxyacetic acid	79-14-1	No information available
Hydrofluoric acid	7664-39-3	No information available

12.4 Mobility in soil
No information available

12.5 Results of PBT and vPvB assessment
No information available.

12.6 Other adverse effects
Endocrine Disruptor Information
This product does not contain any known or suspected endocrine disruptors

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.

14. Transport Information

IMDG/IMO
UN Number: UN3264
UN Proper Shipping Name: Corrosive Liquid, Acidic, Inorganic, N.O.S. (Contains Hydrochloric Acid, Hydrofluoric Acid)
Transport Hazard Class(es): 8
Packing Group: II
Environmental Hazards: Not applicable
EMS: EmS F-A, S-B

RID
UN Number: UN3264
UN Proper Shipping Name: Corrosive Liquid, Acidic, Inorganic, N.O.S. (Contains Hydrochloric Acid, Hydrofluoric Acid)
Transport Hazard Class(es): 8
Packing Group: II
Environmental hazard: Not applicable

ADR
UN Number: UN3264
UN Proper Shipping Name: Corrosive Liquid, Acidic, Inorganic, N.O.S. (Contains Hydrochloric Acid, Hydrofluoric Acid)
Transport Hazard Class(es): 8
Packing Group: II
Environmental hazard: Not applicable

IATA/ICAO
UN Number: UN3264
UN Proper Shipping Name: Corrosive Liquid, Acidic, Inorganic, N.O.S. (Contains Hydrochloric Acid, Hydrofluoric Acid)
Transport Hazard Class(es): 8
Packing Group: II
Environmental hazard: Not applicable

Special Precautions for User None
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable

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

16. Other Information

Full text of R-phrases referred to under Sections 2 and 3

R20 Harmful by inhalation.
R23/24/25 Toxic by inhalation, by contact with skin, and if swallowed.
R26/27/28 Very toxic by inhalation, in contact with skin, and if swallowed.
R34 Causes burns.
R35 Causes severe burns.
R37 Irritating to respiratory system.

Key literature references and sources for data

www.ChemADVISOR.com/

Revision Date: 12-May-2014

Revision Note

Not applicable

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