

1.- Identification of the preparation and of the company

- 1.1 - **Name:** **SH2**
- 1.2 - **Product Applications:** (Sequestering) additive which is added to the crude oil to decrease the reaction of the sulfhidric acid (H₂S) to form sulfuric acid (H₂SO₄).
- 1.3 - **Producer:** **DIQUECINCO 2013, SL**
Calle Arago, 284 bis
08007 Barcelona (Spain)
- 1.4 - **Responsible for MSDS:**
- 1.5 - **Emergency telephone:**

2.- Hazards identification

- 2.1 - **Classification of the product:**
- | | |
|---------------------------------------|--|
| Class: acute toxicity (by inhalation) | Category: 4 |
| Class: skin corrosion/irritation | Category: 3 |
| Class: injury/eye irritation | Category: 2 |
| Class: sensitization for the skin | Category: 1 |
| Class: mutagenicity | Category: 2 |
| Class: STOT (single exposure) | Category: 3 (irritating to respiratory system) |
- 2.2 - **Symbols and Risk Phrases:**
It causes eye irritation, skin and is harmful if inhaled, irritation of the respiratory tract. It is suspected that it caused genetic defects.



- 2.3 -. **Hazards to health:**
- 2.3.1 - Inhalation:**
- | | | |
|-------------------------------------|-------------|--------|
| Harmful if inhaled. | Category: 4 | (H332) |
| Can irritate the respiratory tract. | Category: 4 | (H335) |
- 2.3.3 – Skin Contact:**
- | | | |
|---|-------------|--------|
| Skin irritation. | Category: 3 | (H315) |
| May cause an allergic reaction in the skin. | Category: 1 | (H317) |
- 2.3.3 - Eye Contact:**
- | | | |
|-----------------|-------------|--------|
| Eye irritation. | Category: 2 | (H319) |
|-----------------|-------------|--------|
- 2.3.4 - Others:**
- | | | |
|----------------------------|-------------|--------|
| Can cause genetic defects. | Category: 2 | (H341) |
|----------------------------|-------------|--------|

3.- Composition / Information on components

- 3.1 - Chemical Description:**
Aqueous solution with aldehydes
- 3.2 - Hazards Components:**
Aldehydes and alcohols.

4.- First Aid.

Remove contaminated clothing.

- 4.1 - Eye Contact:**
Flush eyes abundantly for 15 minutes with running water with the eyelids open, subsequent control by the ophthalmologist.
- 4.2 - Contact with skin:**
Wash affected areas with abundant water and soap.
- 4.3 - Ingestion:**
Rinse mouth and then drink plenty of water, approx. 200-300ml. Seek medical assistance.
- 4.4 - Inhalation:**
Remove the affected person to fresh air. Seek medical assistance.

5.- Firefighting measures

- 5.1 - Fire-fighting media:**
Foam, water spray, powder fire extinguishers and carbon dioxide.
- 5.2 - Unsuitable Fire-fighting media:**
Do not use direct water jet.
- 5.3 - Special hazards of exposure to fire:**
In case of fire, oxides of nitrogen and carbon may be released.
- 5.4 - Personal Protective Equipment:**
Use a self-contained breathing apparatus (SCBA) and protective clothing.

6.- Measures in case of accidental spillage

- 6.1 - Personal precautions:**
Avoid contact with skin, eyes and clothing.
- 6.2 - Environmental precautions:**
Prevent from entering sewers, surface water or groundwater.
- 6.3 - Methods of cleaning:**
Small Spills: Pick up with absorbent material (e.g. sand, sawdust, universal absorbent, diatomaceous earth). Dispose the material collected in a regulatory manner.
Large spills: Pump the product.

	Material Safety Data Sheet SH2	Page 3 of 9
---	--	-------------

7.- Handling and storage.

7.1 - Handling:

Good aeration/ventilation of the warehouse and working areas. Avoid formation of aerosol.

Protection against fire and explosion: avoid the accumulation of electrostatic charges. Keep away from sources of ignition. Fire extinguisher accessible

7.2 - Storage:

7.2.1 Suitable materials:

Stainless steel 1.4401 (V4), 1.4301 stainless steel (V2), high density polyethylene (HDPE), glass, low density polyethylene (LDPE)

7.2.2.- Other specifications storage conditions:

Protect from air.

7.2.3.- Stability during storage:

Storage time: 6 months a yellowing is possible after prolonged storage.

A crystalline precipitation or a characteristic turbidity due to the hydrated glyoxal trimer can be observed during storage.

The process is reversible if moderately heated (max. 40 ° C).

Storage time data cited in this safety data sheet is not derived any warranty with respect to the application properties.

7.3 - Specific Uses:

For known uses of the product.

(Sequestering) additive which is added to the crude oil to decrease the reaction of the sulfidric acid (H₂S) to form sulfuric acid (H₂SO₄).

8.- Exposure controls / personal protection.

8.1 - Exposure Limit Values:

VLA-ED 52 mg/m³ value; 20 ppm (LEP (Spain)).

VLA-EC 104 mg/m³ value; 40 ppm (LEP (Spain)).

Effect on the skin (LEP (Spain)). The substance can be absorbed through the skin.

Value VLA-ED 0.1 mg/m³ (LEP (Spain)), inhalable fraction and vapor.

8.1.1.- PNEC

Fresh Water: 0.319 mg/l

Sea water: 0.0319 mg/l

Sporadic release: 1.1 mg/l

Sediment (freshwater): 0.685 mg/kg

Sediment (seawater): 0.0685 mg/kg

Sediment (soil): 4.06 mg/kg

Water Treatment: 4.1 mg/l

8.1.2.- DNEL

Worker: Long term exposure - systemic effects, dermal: 48 mg/kg bw/day

Worker: Long term exposure - systemic effects, inhalation: 16.9 mg/m³

8.2 - Exposure controls.

Follow general protective and hygiene measures.

Avoid contact with the skin, eyes and clothing.

8.2.1 - Collective Protection:

Provide adequate ventilation

8.3 - Personal Protective Equipment.

8.3.1- Respiratory protection:

Protection of the respiratory airway in the event of insufficient ventilation. Filter of gas for organic gases/vapors of low boiling point (boiling point < 65°C, e.g. EN 14387 type AX).

8.3.2 - Protection of hands:

Protective gloves resistant to chemical products (EN 374).

Suitable materials for a brief contact and/or spray (recommended: at least protection index 6, corresponding to > 480 minutes permeation time according to EN 374: e.g., nitrile rubber (0.4 mm), Chloroprene rubber (0.5 mm) rubber, polyvinyl chloride (0.7 mm), among others. Due to the wide variety of types, you must take into account the manufacturer's instructions. It should be noted, that, in practice, the daily use of chemical-resistant protective gloves is clearly inferior, because many influential factors (e.g., temperature), the time determined by the permeability tests.

8.3.3 - Eye protection:

Use safety glasses with side-shields (glasses with frame) (EN 166) and face mask.

8.3.4 - Skin protection:

Select the body protection depending on the activity and possible exposure, e.g. apron, boots protection, protective clothing resistant to chemical products (as in 14605 in case of splashes or in ISO 13982 in case of dust formation).

8.4 - Additional Information:

Do not eat, drink or smoke while working. Wash hands after use.

Change contaminated clothing.

Wash the whole body after work.

You should always have a safety shower and eyewash equipment in the area where the product is handled.

Recommended to have preventive skin care cream.

Use antistatic footwear.

8.5 - Exposure Controls Environment:

Avoid spills and leaks in the basement. Avoid contaminating waterways and dumping the product in the sewage systems.

9.- Physical and chemical properties

9.1 - Overview:

Characteristic odor of the product.

From colorless to yellowish.

9.2 - Important health, safety and environmental information:

pH	2.0 - 3.5
Melting range	-50 to -151
Boiling Point	103.6°C
Flammable Point	No inflammable
Auto-Ignition temperature	approx. 285°C
Vapor pressure	20.2 hPa
Relative density (water = 1) at 20°C	1.27 g/cm ³
Solubility in water	soluble
Log Kow	-1.15 (23°C; pH 7)

Viscosity, dynamic	8 mPa.s (20°C)
Viscosity, kinematic	6.6 mm ² /s (20°C; OECD 114)
	3.38 mm ² /s (20°C; OECD 114)

9.3 - Additional information:

Self-heating capacity	No susceptible not dissociate. based on their chemical structure, are not expected to present surface phenomena used in non-solid or granular form.
pKa	
Surface Tension	
Grain size distribution	
Molar mass	58.04 g/mol

10.- Stability and reactivity

10.1 - Stability:

The product is stable if the rules and indications for storage and handling are taking into consideration.

Formation of flammable gases: in the presence of water there is no formation of flammable gases.

10.2 - Reactivity:

No dangerous reaction if the rules and indications for storage and handling are taking into consideration.

Formation of flammable gases: in the presence of water there is no formation of flammable gases.

10.3 - Dangerous reactions:

Reactions with strong alkalis.

Exothermic reaction.

10.4 - Conditions to avoid:

See section #7 – Handling and Storage.

10.5 - Materials to avoid:

Substances to avoid: strong alkalis.

10.6 - Hazardous decomposition of the products:

No hazardous decomposition of products can occur if the rules and indications for storage and handling are taking into consideration.

11.- Toxicological information

11.1 - Acute toxicity:

11.1.1 – Assessment of acute toxicity:

Moderate toxicity after a short term inhalation. After a single ingestion is practically nontoxic. Practically non-toxic by a single skin contact.

11.1.2 - Experimental/calculated data:

LD50 rat (by ingestion): > 2000 - < 5,000 mg/kg (the OECD directive 401)

LD50 rat (by ingestion): 3,300 mg/kg (the OECD Directive 401)

LC50 rat (inhalation): 0.28 - 0.39 mg/l/4 h (the OECD Directive 403). An aerosol has been tested.

 TM	Material Safety Data Sheet SH2	Page 6 of 9
--	--	-------------

LD50 rat (dermal): > 2,000 mg/kg (OECD 402 directive). It has been tested only one concentration limit (LIMIT test).

11.2 - Irritation:

11.2.1 - Assessment of irritating effects:

In contact with the eyes causes irritation.

In contact with the skin causes irritation. EU-classification may cause irritation to the respiratory tract.

11.2.2.- Experimental and calculated data:

Corrosion/irritation (rabbit): irritant. (Directive 404 of the OECD).

Severe injury/eye irritation (rabbit): irritant. (The OECD directive 405).

11.3 - Respiratory sensitization of the skin:

11.3.1 - Assessment of the sensitization:

Sensitization effect on the skin in animal experiments. Cause sensitization in people.

11.3.2 - Experimental and calculated:

Maximization test in (guinea pig): sensitization to skin (OECD 406 directive).

Maximization test in (humans): sensitization to skin. Bibliographic note.

11.4 - Mutagenicity in germ cell:

11.4.1 - Assessment of mutagenicity:

The substance, despite having mutagenic effects in various trials in microorganisms and cell cultures, these have not been confirmed in tests with mammals. Mutagenicity cannot be excluded on the basis of experimental data.

11.5 - Carcinogenicity:

11.5.1 - Assessment of carcinogenicity:

In numerous test, the substance has not presented any carcinogenic effect.

11.6 - Reproductive toxicity:

11.6.1 - Assessment of reproduction toxicity:

No effects that harm fertility were observed during test in the animal.

11.7 - Developmental toxicity:

11.7.1 - Assessment of teratogenicity:

In animal experiments, effects that harm fertility were not observed.

11.8.- Specific toxicity in organs diana (single exposure):

11.8.1 - Simple evaluation of the STOT (specific target organ toxicity):

It may cause irritation to the respiratory tract.

11.9.- Toxicity on repeated doses and organ specific toxicity (repeated exposure)

11.9.1 Toxicity in the case of frequent application:

In the event of a repeated inhalation, the substance can cause damage to the upper respiratory tract (result of experimental testing on animals).

11.10.- Aspiration hazard:

Not applicable.

12.- Ecological information.

12.1 - Ecotoxicity:

12.1.1 - Assessment of aquatic toxicity:

There is a high probability that the product is not harmful to aquatic organisms. During a spill in small concentrations in biological treatment plants, they are not expected variations in the function of the activated sludge.

12.1.2 - fish toxicity:

LC50 (96 h) > 460 - < 680 mg/l, *Leuciscus idus* (DIN 38412 part 15, static). Nominal concentration. Data have been inferred from the values obtained for a preparation or mixture with a lower concentration of the substance.

12.1.3 - Aquatic invertebrates:

EC50 (48 h) 404 mg/l *Daphnia magna* (Directive 79/831/EEC, static). Nominal concentration. Data have been inferred from the values obtained for a preparation or mixture with a lower concentration of the substance.

12.1.4 - Aquatic plants:

EC50 (72 h) > 100 mg/l (growth rate), *Scenedesmus subspicatus* (directive 201 OECD, static). Nominal concentration. The data were calculated from the values of a preparation with a lower concentration of the substance.

12.1.5 - Microorganisms/Effect on activated sludge:

EC20 (0.5 h) > 1,000 mg/l, activated sludge (directive 209 OECD, static).

12.1.6 - Chronic toxicity to fish:

NOEC (34 days) 112 mg/l, *Pimephales promelas* (continuous flow). The data were calculated from the values of a preparation with a lower concentration of the substance.

12.1.7 - Chronic-Toxicity in aquatic invertebrates:

NOEC (21 days) 3.19 mg/l *Daphnia magna* (OECD, semi-static directive 211). The data were calculated from the values of a preparation with a lower concentration of the substance.

12.1.8 - Toxicity in land plants:

LC50 (14 days) > 398 mg/kg, *Eisenia foetida* (Directive 207 OECD artificial soil). Other (s) (28 days) > 400 mg/kg, microorganisms that live in the soil (OECD 217). The indication of the toxic effect refers to the nominal concentration. Other (s) (28 days) > 400 mg/kg, microorganisms that live in the soil (OECD 216) the indication of the toxic effect refers to the nominal concentration.

12.1.9 - Land plants:

NOEC (21 days), *Brassica napus* (directive 208 OECD)

12.2 - Mobility in the soil**12.2.1- Assessment of transport between environmental areas:**

The substance does not evaporate into the atmosphere from the water surface. An absorption in the solid particles of the soil is not predictable.

12.3 - Persistence and degradability:**12.3.1 - Assessment of biodegradation and elimination (H2O):**

Easily biodegradable (according to OECD criteria).

12.3.2. - Indications for disposal:

90-100% reduction of doc (dissolved organic carbon) (19 days) (OECD 301A (new version)) (aerobic, domestic, activated sludge, not adapted).

12.3.3. - Evaluation of stability in water:

According to the chemical structure no hydrolysis is not expected.

12.3.4 – Bioaccumulation potential:

It is not expect a significant accumulation in organisms. Bio-concentration factor: 3.2 (calculated)

12.4 - Results of PBT and vPvB assessment:

According to Annex XIII of the Regulation (EC) No. 1907/2006 concerning the registration, evaluation, authorization and restriction of chemicals substances (REACH). The product does not contain any substances that meet the PBT criteria

(persistent/bioaccumulable/toxic) or the vPvB (very persistent/very bioaccumulable) self-classification criteria.

12.6.- Additional indications:

Chemical oxygen demand (COD): 350 mg/g

13.- Terms of elimination

13.1 - Waste Disposal:

Take into account the local regulations, it should be disposed in a landfill or in a proper incineration plant.

The code of residue, according to the European list of waste (CER), cannot be determined, since it depends on the use of the product.

The code of waste in accordance with the European waste catalogue (EWC) must be specified in cooperation with the manufacturer and the authorities.

13.2 - Disposal of containers:

Not contaminated containers can be recycled.

14.- Transport information.

Transport in sealed containers that are upright and secure.

Ensure that persons transporting the product know what to do in case of an accident or spillage.

14.1 - Transport by Road (ADR):

UN Number: No applicable

14.2 - Sea transport (IMDG):

UN Number: No applicable

14.3 - Rail transport (RID):

UN Number: No applicable

14.4 - Air transport (ICAO/IATA):

UN Number: No applicable

15.- Regulatory information

15.1 - Hazard symbols:



15.2 - Risk phrases:

Harmful.

Harmful by inhalation.

Irritating to eyes, skin and respiratory tract.

May cause sensitization by skin contact.

 TM	Material Safety Data Sheet SH2	Page 9 of 9
--	--	-------------

Possible risk of irreversible effects.
Harmful if swallowed.
Acute toxicity.
Corrosion / irritation of the skin.
Serious injury / eye irritation.
Skin sensitization.
Mutagenicity skin sensitizer.
Germ cell mutagenicity.
STOT (single exposure).
Specific target organ toxicity (single exposure)
STOT (repeated exposure)
Specific target organ toxicity (repeated exposure)
Category 3 mutagens.
Substances whose possible mutagenic effects in humans are worrying.

15.3 - Safety phrases:

H319 causes serious eye irritation.
H315 causes skin irritation.
H332 harmful if inhaled.
H317 may cause an allergic reaction in the skin.
H335 may irritate respiratory tract.
H341 is suspected to cause genetic defects.
H302 harmful if swallowed.
H373 may cause damage to organs after prolonged or repeated exposures.

15.4 - Additional Information:

Conforms to Regulation (EC) 1272/2008.

16.- Other Information

16.1 - Additional Recommendations:

Observe the legal ordinances on chemicals products.

16.2 - Technical point of contact:

In regards to the product: Technical Department. Phone

In regards to the Material Safety Data Sheet: Technical Department. Phone

16.2 - Review of the Material Safety Data Sheet:

All the points in this Material Safety Data Sheet has been reviewed.

16.4 - Further information.