SAFETY DATA SHEET

accordance with Annex II of Regulation (EC) No 1907/2006 and its amendment(s)

Product: **SULFURIC ACID (PROCESS)** Page: 1 / 8

SDS No.: 003612-001 (Version 5.1) Date 10.02.2017 (*Cancel and replace* : 03.03.2014)

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Identification of the product

Identification of the mixture: SULFURIC ACID (PROCESS)

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

Use of the Substance/Mixture :

Sector of use :	Product category :
Use as an intermediate in manufacture of inorganic and organic chemicals including fertilizers **SU3:** Industrial Manufacturing (all)**, SU4:** Manufacture of food products**, SU6b:** Manufacture of pulp, paper and paper products**, SU8:** Manufacture of bulk, large scale chemicals (including petroleum products)**, SU9:** Manufacture of fine chemicals**, SU14:** Manufacture of basic metals, including alloys	**PC19:** Intermediate
Use as a processing aid, catalyst, dehydrating agent and pH regulator **SU3:** Industrial Manufacturing (all)**, SU4:** Manufacture of food products**, SU5:** Manufacture of textiles, leather, fur**, SU6b:** Manufacture of pulp, paper and paper products**, SU8:** Manufacture of bulk, large scale chemicals (including petroleum products)**, SU9:** Manufacture of fine chemicals**, SU11:** Manufacture of rubber products**, SU23:** Electricity, steam, gas water supply and sewage treatment	**PC20:** Products such as pH-regulators, flocculants, precipitants, neutralization agents

1.3. Details of the supplier of the safety data sheet

Supplier

ARKEMA
Specialty Polyamides
420 rue d'Estienne d'Orves
92705 Colombes Cedex, FRANCE
Telephone: +33 (0)1 49 00 80 80
Telefax: +33 (0)1 49 00 83 96
E-mail address: pars-drp-fds@arkema.com
http://www.arkema.com

E-mail address : Exposure scenario

arkema-techpolymer-reach-uses@arkema.com

1.4. Emergency telephone number

+ 33 1 49 00 77 77
European emergency phone number: 112

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008):
Skin corrosion, 1A, H314
Serious eye damage, 1, H318

Additional information:
For the full text of the H, EUH-phrases mentioned in this Section, see Section 16.

2.2. Label elements

Label elements (REGULATION (EC) No 1272/2008):

Hazardous components which must be listed on the label:

sulphuric acid...%

Hazard pictograms:

Signal word: **Danger**

Hazard statements:
H314 : Causes severe skin burns and eye damage.

Precautionary statements:
Prevention:
P260 : Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P280 : Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
P303 + P361 + P353 : IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
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/doctor.

2.3. Other hazards

Potential health effects:
Corrosive liquid Severely irritating to respiratory system Risk of pulmonary oedema

Environmental Effects:
Harmful to fish.

Physical and chemical hazards:
Forms flammable and explosive hydrogen through corrosion of metals. (Corrosion or work with heat sources) Thermal decomposition giving toxic products
Decomposition products: See chapter 10

Other:
Results of PBT and vPvB assessment : According to REACH regulation, annex XIII, the substance does not meet PBT and vPvB criteria.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

Chemical nature of the mixture[1]:
Aqueous solution

Hazardous components (accordance with Annex II of Regulation (EC) No 1907/2006 and its amendment(s)) :

Chemical name[1] & REACH Registration Number[2]	EC-No.	CAS-No.	Concentration	Classification REGULATION (EC) No 1272/2008
Sulphuric acid (01-2119458838-20) (N° ANNEX: 016-020-00-8)	231-639-5	7664-93-9	65 - 75 %	Skin Corr. 1A; H314 Eye Dam. 1; H318

[1]: See chapter 14 for Proper Shipping Name
[2] :See the text of the regulation for applicable exceptions or provisions : The transition time according to REACH Regulation, Article 23, is still not expired.

4. FIRST AID MEASURES

4.1. Description of necessary first-aid measures:

General advice:
Under the shower: Take off immediately all contaminated clothing. including shoes.

Inhalation:
Inhalation of vapours/mists Move to fresh air. Oxygen or artificial respiration if needed. Hospitalize immediately.

Skin contact:
Shower immediately, rapidly taking off all contaminated clothing whilst under the shower, washing abundantly and thoroughly with water. Finish by washing with a neutralising solution (Triethanolamine 5 - 10%). In case of extensive burns, hospitalize.

Eye contact:
Wash open eyes immediately, abundantly and thoroughly for at least 15 minutes. Consult an ophthalmologist immediately.

Ingestion:
Do not induce vomiting, rinse mouth and lips with plenty of water if the subject is conscious, then hospitalize.

Protection of first-aiders:
In case of insufficient ventilation, wear suitable respiratory equipment. Protective suit

4.2. Most important symptoms/effects, acute and delayed: No data available.

4.3. Indication of immediate medical attention and special treatment needed, if necessary: No data available.

5. FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media: Carbon dioxide (CO_2), Dry powder

Unsuitable extinguishing media: Water

5.2. Special hazards arising from the substance or mixture:
Forms flammable and explosive hydrogen through corrosion of metals., (Corrosion or work with heat sources), Formation of toxic products through combustion:, Sulphur oxides

5.3. Advice for firefighters:

Specific methods:
In case of fire nearby, remove exposed containers. Suppress gases, fumes and/or dust with water spray jet. Ensure a system for the rapid emptying of containers. Containers/tanks should be cooled with water spray. Do not pour water onto the acid.

Special protective actions for fire-fighters:
In the event of fire, wear self-contained breathing apparatus. Acid resistant clothing.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures:
Prohibit contact with skin and eyes and inhalation of vapours. Prohibit all sources of sparks and ignition - Do not smoke. Evacuate area of all unnecessary personnel. Ensure adequate ventilation. Wear personal protective equipment.

6.2. Environmental precautions:
Do not release into the environment. Do not let product enter drains. Dam up with sand or inert earth (do not use combustible materials).

6.3. Methods and materials for containment and cleaning up:

Methods for cleaning up:
Keep in suitable, closed containers for disposal.

Recovery:
When hot : capture the gas with fine water spray (scrubbing), collect and treat contaminated water. Pump into a labelled inert emergency tank. Dilute the puddles with water and recover it.

Neutralisation:
Dilute with water (do not pour water onto the acid). Neutralize with an alkaline carbonate.

Elimination: See chapter 13

6.4. Reference to other sections: None.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling:

Technical measures/Precautions:
Storage and handling precautions applicable to products: Liquid. Corrosive. Provide appropriate exhaust ventilation at machinery. Provide showers, eye-baths. Provide water supplies near the point of use. Provide self-contained breathing apparatus nearby (for emergency intervention).

Safe handling advice:

Prohibit ignition sources near the point where containers are opened - Do not smoke. Work with heat sources : Hot work permit. Do not pour water onto the acid. Slowly put the acid into the water (very exothermic reaction). Clean up puddles of product immediately. Provide waterproof electrical equipment.

Hygiene measures:
Remove immediately soaked or soiled clothing. Wash separately. Prohibit contact with skin and eyes and inhalation of vapours. When using do not eat, drink or smoke.
Wash hands after handling. Remove contaminated clothing and protective equipment before entering eating areas.

7.2. Conditions for safe storage, including any incompatibilities:
Keep containers tightly closed in a cool, well-ventilated place. Protect from heat. Store in containers equipped with dehumidifiers. Provide a catch-tank and an impermeable corrosion-resistant floor with drainage to a neutralization tank within a bunded area. Provide electrical earthing and waterproof equipment. Provide an anti-corrosion protected electrical equipment in a bunded area.

Incompatible products:
Propargylic alcohol (explosive reaction) Water Bases Combustible material Oxidizing agents

Packaging material:
Recommended: Small quantities :, Plastic materials, Carbon steel
For large volumes :, Carbon steel
To be avoided: Light metals and alloys in the presence of humidity, including parts of the installation in contact with the product

7.3. Specific end use(s): None.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters:

Exposure Limit Values

Sulphuric acid

Source	Date	Value type	Value (ppm)	Value (mg/m3)	Remarks
EU ELV	12 2009	TWA	–	0,05	Mist Indicative value
ACGIH (US)	02 2012	TWA	–	0,2	Thoracic fraction.

Derived No Effect Level (DNEL):

End Use	Inhalation	Ingestion	Skin contact
Workers	0,1 mg/m3 (LE, ST) 0,05 mg/m3 (LE, LT)		

LE : Local effects, **SE** : Systemic effects, **LT** : Long term, **ST** : Short term

Predicted No Effect Concentration:

Compartment:	Value:
Fresh water	0,0025 mg/l
Marine water	0,00025 mg/l
Effects on waste water treatment plants	8,8 mg/l
Fresh water sediment	0,002 mg/kg dw
Marine sediment	0,002 mg/kg dw

8.2. Exposure controls:
General protective measures: Ensure sufficient air exchange and/or exhaust in work areas

Personal protective equipment:
Respiratory protection: In case of insufficient ventilation, wear suitable respiratory equipment.
High concentrations or prolonged activity: Full mask. Recommended Filter type: A2B2
Hand protection: Splash contact, intermittent and prolonged PVC gloves
According to permeation index EN 374: 4 (time elapsed > 120 mins)
Eye/face protection: Safety glasses with side-shields, In case of spattering :, Face-shield
Skin and body protection: At the workplace : anti-acid suit, anti acid boots
Intervention at incident: anti-acid diving suit

Environmental exposure controls: See chapter 6

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance:	
Physical state (20°C):	liquid
Colour:	black
Odour:	stinging
Olfactory threshold:	No data available.
pH:	pH < 1, Very acidic
Melting point/range :	< -10 °C
SULPHURIC ACID :	
	310 - 335 °C (Concentration: 98%) (OECD Test Guideline 103)
Flash point:	No flash point in test conditions
Evaporation rate:	No data available.
Flammability (solid, gas):	
Flammability:	Non flammable product
Vapour pressure:	< 3 hPa , at 20 °C
	< 22 hPa , at 50 °C
Vapour density:	Not applicable
Density:	1.600 kg/m3 , at 20 °C
Water solubility:	completely soluble at 20 °C
Partition coefficient: n-octanol/water:	Not applicable
Auto-ignition temperature:	Non flammable product
Decomposition temperature:	No data available.
Viscosity, dynamic:	5 - 10 mPa.s , at 25 °C
Explosive properties:	
Explosivity:	Not relevant (due to the chemical structure)
Oxidizing properties:	Not relevant (due to the chemical structure)

9.2. Other data: None.

10. STABILITY AND REACTIVITY

10.1. Reactivity: No data available.

10.2. Chemical stability:
The product is stable under normal handling and storage conditions., Hygroscopic product

10.3. Possibility of hazardous reactions:
None known.

10.4. Conditions to avoid:
Protect from heat.

10.5. Incompatible materials to avoid:
Propargylic alcohol (explosive reaction)
Water
Strong bases (Exothermic reaction.)
Combustible material (carbonization)
Oxidizing agents
Metals (when hot or In presence of moisture)

10.6. Hazardous decomposition products:
Forms flammable and explosive hydrogen through corrosion of metals., Formation of toxic products through combustion:, Sulphur oxides

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects:

Acute toxicity:

Inhalation:	**Severely irritating to respiratory system** Risk of pulmonary oedema
• In animals :	LC50/Rat: 0,37 mg/l (Method: OECD Test Guideline 403) (Aerosol)
Ingestion:	**Slightly harmful by ingestion** Causes severe digestive tract burns.

LD50/Rat: 2.140 mg/kg (Method: OECD Test Guideline 401)

Local effects (Corrosion / Irritation / Serious eye damage):

Skin contact: **Corrosive to skin**

Eye contact: **Corrosive to eyes**
Serious lesions with possible after-effects if not washed immediately

Respiratory or skin sensitisation:

Inhalation:
No reported effect on man

Skin contact:
There is no data available for this product.

CMR effects :

Mutagenicity: **Results from in vitro and in vivo tests do not lead to considering the product as genotoxic**

In vitro
Ames test: Inactive
Chromosome aberration test in vitro: Inactive

Carcinogenicity:
Epidemiological studies have described an increased risk of cancer of the pharynx amongst persons repeatedly occupationally exposed to elevated concentrations of mists containing concentrated sulphuric acid According to available experimental data:

Reproductive toxicity:

Foetal development: **Based on the available data, the substance is not suspected of having developmental toxicity potential.**
• In animals : Absence of toxic effects for foetal development at non toxic maternal doses
(Method: OECD Test Guideline 414, mouse, rabbit)

Specific target organ toxicity :
Single exposure :

Inhalation: **Risk of irritation of respiratory system Risk of pulmonary oedema**
Asthma-like after-effects possible following a period of acute poisoning

Repeated exposure: **The substance or mixture is not classified as specific target organ toxicant, repeated exposure.**
According to available experimental data:
No specific toxic effects
(Rat)
• In animals : By inhalation: Local irritation of the respiratory system
NOAEL= 0,0003 mg/l (Method: OECD Test Guideline 412, Rat, 28 d) (Aerosol)
• In man : Lung irritation
Dental erosions

Aspiration hazard: No data available.

12. ECOLOGICAL INFORMATION

Ecotoxicology Assessment: All available and relevant data on this product and/or the components quoted in section 3 and/or the analogue substances/metabolites have been taken into account for the hazard assessment.

Acute aquatic toxicity : Harmful to aquatic life.

12.1. Acute toxicity :

Fish: **Harmful to fish.**
LC50, 96 h (Lepomis macrochirus (Bluegill sunfish)) : from 16 - 28 mg/l

Aquatic invertebrates: **Slightly harmful to daphnia**
EC50, 48 h (Daphnia magna (Water flea)) : > 100 mg/l (Method: OECD Test Guideline 202)

Aquatic plants: **Slightly harmful to algae**
EC50, 72 h (Desmodesmus subspicatus (green algae)) : > 100 mg/l (Method: OECD Test Guideline 201, growth rate)

Microorganisms:
NOEC (Activated sludge) : = 26.000 mg/l (Results obtained on a similar product).

Aquatic toxicity / Long term toxicity:

Aquatic plants: NOEC, 72 h (Desmodesmus subspicatus (green algae)) : = 100 mg/l (Method: OECD Test Guideline 201, growth rate)

12.2. Persistence and degradability :

Stability in water:
Formation of salts in solution in the environment

Biodegradation (In water):
Not applicable

12.3. Bioaccumulative potential :
Not applicable

12.4. Mobility in soil - Distribution among environmental compartments:

Vapor pressure: < 3 hPa, 20 °C
< 22 hPa, 50 °C

Absorption / desorption: Not applicable

12.5. Results of PBT and vPvB assessment :
According to REACH regulation, annex XIII, the substance does not meet PBT and vPvB criteria.

12.6. Other adverse effects: None known.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment:

Disposal of product: Dilute with water (do not pour water onto the acid). Neutralize with an alkaline carbonate. Dispose of in accordance with local regulations.

Disposal of packaging: Clean container with water (recover waste water for treatment later). Neutralize with an alkaline carbonate. Destroy packaging by incineration at an approved waste disposal site. In accordance with local and national regulations.

14. TRANSPORT INFORMATION

Regulation	14.1. UN number	14.2.UN proper shipping name	14.3.Class*	Label	14.4. PG*	14.5. Environmental hazards	14.6. Special precautions for user
ADR	1830	SULPHURIC ACID	8	8	II	no	
ADN	1830	SULPHURIC ACID	8	8	II	no	
RID	1830	SULPHURIC ACID	8	8	II	no	
IATA Cargo	1830	Sulphuric acid	8	8	II	no	
IATA Passenger	1830	Sulphuric acid	8	8	II	no	
IMDG	1830	SULPHURIC ACID	8	8	II	no	EmS Number: F-A, S-B

*Description: 14.3. Transport hazard class(es)
14.4. Packing group

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

15. REGULATORY INFORMATION

Safety data sheets: accordance with Annex II of Regulation (EC) No 1907/2006 and its amendment(s)

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

Listed in:

EU. Annex to Regulation No. 111/2005 laying down rules for drug precursors: sulphuric acid...%

15.2. Chemical safety assessment:
A Chemical Safety Assessment has been carried out for this substance.

INVENTORIES:

EINECS:	Conforms to
TSCA:	Conforms to
DSL:	All components of this product are on the Canadian DSL
IECSC (CN):	Conforms to
ENCS (JP):	Does not conform
ISHL (JP):	Does not conform
KECI (KR):	Conforms to
PICCS (PH):	Conforms to
AICS:	Conforms to
NZIOC:	Conforms to

16. OTHER INFORMATION

Full text of H, EUH-phrases referred to under sections 2 and 3

H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.

Further information: This product must be handled only by personnel well informed of safety conditions., When used in formulations, contact us for labelling.

Update:

Safety datasheet sections which have been updated:		Type:
7	Packaging material	Revisions
15	Inventories	Revisions

Thesaurus:
NOAEL : No Observed Adverse Effect Level (NOAEL)
LOAEL : Lowest Observed Adverse Effect Level (LOAEL)
bw : Body weight
food : oral feed
dw : Dry weight
vPvB : very Persistent and very Bioaccumulative
PBT : Persistent, Bioaccumulative and Toxic

This information applies to the PRODUCT AS SUCH and conforming to specifications of ARKEMA. In case of formulations or mixtures, it is necessary to ascertain that a new danger will not appear. The information contained is based on our knowledge of the product, at the date of publishing and it is given quite sincerely. Users are advised of possible additional hazards when the product is used in applications for which it was not intended. This sheet shall only be used and reproduced for prevention and security purposes. The references to legislative, regulatory and codes of practice documents cannot be considered as exhaustive. It is the responsibility of the person receiving the product to refer to the totality of the official documents concerning the use, the possession and the handling of the product. It is also the responsibility of the handlers of the product to pass on to any subsequent persons who will come into contact with the product (usage, storage, cleaning of containers, other processes) the totality of the information contained within this safety data sheet and necessary for safety at work, the protection of health and the protection of environment.

NB: In this document the numerical separator of the thousands is the "." (point), the decimal separator is "," (comma).