

**WTW Safety Data Sheet**  
According to EC Directives 91/155/EEC

**1. Identification of the substance/preparation and of the company/undertaking**

*Product name:*

**Reagent A / oxidizing reagent**

**Ord. No.:** 821 095

**Model:** R/P511

*Manufacturer:*

WTW Wissenschaftlich-Technische Werkstätten GmbH, Dr.-Karl-Slevogt-Straße 1, D-82362 Weilheim, Germany, Tel.: +49(0)881 183-0, Fax.: +49(0)881 183-420

Emergency telephone:  
(001)-703-527-3887

**2. Composition/information on ingredients**

*Chemical characterization:* Aqueous saline solution

*Hazardous ingredients:* Sodium peroxydisulfate

*Hazard symbols:* Oxidizing (O) and harmful (Xn)

*R-phrases:* 8-22-36/37/38-42/43

*Content:* 4,8 %

*CAS-No.:* 7775-27-1

*EINECS-No.:* 231-892-1

*EG-No.:* 231-892-1

**3. Hazards identification**

May cause sensitization by skin contact.

**4. First aid measures**

*After inhalation:* Fresh air

*After skin contact:* Wash off with plenty of water.  
Remove contaminated clothing.

*After eye contact:* Rinse out with plenty of water with the eyelid held wide open. Summon eye specialist.

*After ingestion:* Make injured person drink plenty of water, induce vomiting, summon doctor.

# WTW Safety Data Sheet

## Identification of the substance/preparation

### Reagent A / oxidizing reagent

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#### 5. Fire-fighting measures

<i>Suitable extinguishing media:</i>	Water, CO <sub>2</sub> , foam, powder
<i>Unsuitable extinguishing media:</i>	No information available
<i>Special risks:</i>	Development of hazardous gases and vapours possible in the event of fire (sulfur oxides).
<i>Other information:</i>	Use chemical protection clothing and selfcontained apparatus in dangerous zone. Non combustible.

#### 6. Accidental release measures

<i>Personal-related precautionary measures:</i>	Avoid contact with eyes and skin.
<i>Environmental-protection measures:</i>	Do not allow to enter sewerage system.
<i>Procedures for cleaning/absorption:</i>	Take up with liquid-absorbent and non combustible material (e.g. sand). Forward for disposal. Clean up affected area with water.

#### 7. Handling and storage

<i>Handling:</i>	No further requirements
<i>Storage:</i>	Store tightly closed.

#### 8. Exposure control/personal protection

<i>Specific control parameters:</i>	None
Personal protective equipment	
<i>Respiratory protection:</i>	Only required when aerosols are generated.
<i>Eye protection:</i>	Protective glasses
<i>Hand protection:</i>	Gloves (nitrile rubber)
<i>Industrial hygiene:</i>	Wash hands and face after working with solution. Change contaminated clothing.

# WTW Safety Data Sheet

## Identification of the substance/preparation

### Reagent A / oxidizing reagent

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## 9. Physical and chemical properties

<i>Form:</i> Liquid	<i>Colour:</i> Colourless	<i>Odour:</i> Odourless
<i>pH-value</i>	ca. 3,0-3,3 at 25°C	
<i>Melting temperature:</i>	°C	
<i>Boiling temperature:</i>	°C	
<i>Ignition temperature:</i>	°C	
<i>Flash point:</i>	°C	
<i>Explosion limite lower:</i>	/	
<i>                                  upper:</i>	/	
<i>Density:</i>	ca. 1.04 g/cm <sup>3</sup>	
<i>Solubility in water:</i>	miscible	
<i>Thermal decomposition:</i>	> 148°C for sodium peroxydisulfate	

## 10. Stability and reactivity

<i>Conditions to be avoided:</i>	Heating
<i>Substances to be avoided:</i>	Reducing agents, combustible substances
<i>Hazardous decomposition products:</i>	Hydrogen peroxide, oxygen and eventually ozone
<i>Further information:</i>	None

## 11. Toxicological information

<i>Acute toxicity:</i>	LD 50 oral: 902 mg/kg for sodium peroxydisulfate
<i>Further toxicological information:</i>	After skin contact: Severe irritations. Risk of sensitization. After eye contact: Severe irritations. After swallowing: Mucosal irritations, coughing, dyspnoea, nausea, headache. Possible damages: pulmonary oedema. After inhalation of aerosols: Irritation symptoms in the respiratory tract. Sensitizer.

## 12. Ecological information

<i>Ecotoxic effects:</i>	Solution forms toxic decomposition products. Harmful effect on aquatic organisms. Harmful effect due to pH-shift.
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# WTW Safety Data Sheet

## Identification of the substance/preparation

### Reagent A / oxidizing reagent

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## 13. Disposal considerations

*Products:* There are no uniform regulations for the disposal of chemicals or residues. The disposal is regulated through corresponding regional laws and regulations. We recommend that you contact either the authorities in charge or approved waste disposal companies which will advise you on how to dispose the special waste.

*Packaging:* Handle contaminated packaging in the same way as the substance itself. If not officially specified differently, noncontaminated packaging may be treated like household waste or recycled.

## 14. Transport information

*ADR/GGVSE:* UN 3216, Persulfate, anorganische, wässrige Lösung, N.A.G. (Natriumperoxodisulfat), 5.1 III

*IMDG/GGVSee:* UN 3216, Persulphates, inorganic, aqueous solution, n.o.s. (Sodium peroxodisulfate), 5.1 III, EmS-No.: F-A, S-Q

*ICAO/IATA:* UN 3216, Persulphates, inorganic, aqueous solution, n.o.s. (Sodium peroxodisulfate), 5.1 III

*Further information:* None

## 15. Regulatory information

Labelling according to EC directives

*Symbol:* Irritant (Xi)  
*R-phrases:* 43 May cause sensitization by skin contact.  
*S-phrases:* 24-26-37 Avoid contact with skin. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable gloves.

German regulations

*Water pollution class:* WGK: 1 slightly polluting substance  
*Storage class:* 5.1 B  
*Regulation on combustible liquids:* VbF: Aqueous solution, non-combustible  
*Other regulations:* None

## 16. Other information

Date of issue: 15.07.2006  
Supersedes edition of 18.02.2004  
Reason for alteration: General update

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

**WTW Safety Data Sheet**  
According to EC Directives 91/155/EEC

**1. Identification of the substance/preparation and of the company/undertaking**

*Product name:*

**Reagent B / hydrolysis reagent**

**Ord. No.:** 821 095

**Model:** R/P511

*Manufacturer:*

WTW Wissenschaftlich-Technische Werkstätten GmbH, Dr.-Karl-Slevogt-Straße 1, D-82362 Weilheim, Germany, Tel.: +49(0)881 183-0, Fax.: +49(0)881 183-420

Emergency telephone:  
(001)-703-527-3887

**2. Composition/information on ingredients**

*Chemical characterization:* Aqueous acid solution

*Hazardous ingredients:* Sulphuric acid

*Hazard symbols:* Corrosive (C)

*R-phrases:* 35

*Content:* 3,6 %

*CAS-No.:* 7664-93-9

*EG-Index-No.:* 016-020-00-8

*EINECS-and EG-No.:* 231-639-5

**3. Hazards identification**

No hazardous product

**4. First aid measures**

*After inhalation:* Fresh air

*After skin contact:* Wash off with plenty of water.  
Remove contaminated clothing.

*After eye contact:* Rinse out with plenty of water with the eyelid held wide open. Summon eye specialist.

*After ingestion:* Make injured person drink plenty of water.  
(if necessary several liters)  
Immediately summon doctor.

# WTW Safety Data Sheet

## Identification of the substance/preparation

### Reagent B / hydrolysis reagent

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#### 5. Fire-fighting measures

<i>Suitable extinguishing media:</i>	Water, CO <sub>2</sub> , foam, powder
<i>Unsuitable extinguishing media:</i>	No information available
<i>Special risks:</i>	Development of hazardous gases and vapours possible in the event of fire (sulfur oxides). Do not stay in dangerous zone without suitable chemical protection clothing and self-contained breathing apparatus.
<i>Other information</i>	Generation of hydrogen is possible by contact with metals. Danger of explosion.

#### 6. Accidental release measures

<i>Personal-related precautionary measures:</i>	Do not inhale vapours/aerosols. Avoid contact with eyes and skin.
<i>Environmental-protection measures:</i>	Do not allow to enter sewerage system.
<i>Procedures for cleaning/absorption:</i>	Take up with liquid-absorbent material. Forward for disposal. Clean up affected area with water.

#### 7. Handling and storage

<i>Handling:</i>	No further requirements
<i>Storage:</i>	Tightly closed at room temperature.

#### 8. Exposure control/personal protection

<i>Specific control parameters:</i>	MAK-value (Germany): 0.1 mg/m <sup>3</sup> for sulphuric acid Class. pregnancy C
Personal protective equipment	
<i>Respiratory protection:</i>	Required when vapours are generated.
<i>Eye protection:</i>	Protective glasses
<i>Hand protection:</i>	Gloves (nitrile rubber)
<i>Industrial hygiene:</i>	Wash hands and face after working with solution. Change contaminated clothing.

# WTW Safety Data Sheet

## Identification of the substance/preparation

### Reagent B / hydrolysis reagent

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## 9. Physical and chemical properties

<i>Form:</i> Liquid	<i>Colour:</i> Colourless	<i>Odour:</i> Odourless
<i>pH-value</i>	0.1 to 0.2 at 25°C	
<i>Melting temperature:</i>	°C	
<i>Boiling temperature:</i>	°C	
<i>Ignition temperature:</i>	°C	
<i>Flash point:</i>	°C	
<i>Explosion limite lower:</i>	/	
<i>                          upper:</i>	/	
<i>Density:</i>	ca. 1,02 g/cm <sup>3</sup>	
<i>Solubility in water:</i>	miscible	
<i>Thermal decomposition:</i>	/	

## 10. Stability and reactivity

<i>Conditions to be avoided:</i>	Strong heating
<i>Substances to be avoided:</i>	Metals, alkalies and bases
<i>Hazardous decomposition products:</i>	Not known
<i>Further information:</i>	None

## 11. Toxicological information

<i>Acute toxicity:</i>	LD 50 (oral, rat): 2140 mg/kg for sulphuric acid
<i>Further toxicological information:</i>	After inhalation of vapours: damage of the affected mucous membranes. After skin contact: severe burns. After eye contact: burns, corneal lesions, risk of serious damage to eyes. After swallowing: risk of perforation, nausea, vomiting, and diarrhoea. After a latency period of several weeks possibly pyloric stenosis.

## 12. Ecological information

<i>Ecotoxic effects:</i>	Toxic for aquatic organisms due to pH-shift. Caustic even in diluted form. Toxic effect on fish and algae. Do not allow to enter drinking water supplies, waste water or soil.
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# WTW Safety Data Sheet

## Identification of the substance/preparation

### Reagent B / hydrolysis reagent

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#### 13. Disposal considerations

*Products:* There are no uniform regulations for the disposal of chemicals or residues. The disposal is regulated through corresponding regional laws and regulations. We recommend that you contact either the authorities in charge or approved waste disposal companies which will advise you on how to dispose the special waste.

*Packaging:* Handle contaminated packaging in the same way as the substance itself. If not officially specified differently, noncontaminated packaging may be treated like household waste or recycled.

#### 14. Transport information

*ADR/GGVSE:* UN 3264, Ätzender, saurer, anorganischer, flüssiger Stoff, N.A.G. (Schwefelsäurelösung), 8 III  
*IMDG/GGVSee:* UN 3264, Corrosive liquid, acidic, inorganic, n.o.s. (Sulphuric acid solution), 8 III, EmS-No.: F-A, S-B  
*ICAO/IATA:* UN 3264, Corrosive liquid, acidic, inorganic, n.o.s. (Sulphuric acid solution), 8 III  
*Further information:* None

#### 15. Regulatory information

Labelling according to EC directives

*Symbol:* No hazardous product  
*R-phrases:* /  
*S-phrases:* /

German regulations

*Water pollution class;* WGK: 1 slightly polluting substance  
*Storage class:* 8 B  
*Regulation on combustible liquids;* VbF: Aqueous solution, non-combustible.  
*Other regulations:* None

#### 16. Other information

Date of issue: 15.07.2006  
Supersedes edition of 18.02.2004  
Reason for alteration: General update

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

**WTW Safety Data Sheet**  
According to EC Directives 91/155/EEC

**1. Identification of the substance/preparation and of the company/undertaking**

*Product name:*

**Reagent C / reducing reagent**

**Ord. No.:** 821 095

**Model:** R/P511

*Manufacturer:*

WTW Wissenschaftlich-Technische Werkstätten GmbH, Dr.-Karl-Slevogt-Straße 1, D-82362 Weilheim, Germany, Tel.: +49(0)881 183-0, Fax.: +49(0)881 183-420

Emergency telephone:  
(001)-703-527-3887

**2. Composition/information on ingredients**

*Chemical characterization:* White powder

*Hazardous ingredients:* Ascorbic acid

*Hazard symbols:* No hazardous product.

*R-phrases:* /

*Content:* 100 %

*CAS-No.:* 50-81-7

*EINECS-No.:* 200-066-2

*EG-No.:* 200-066-2

**3. Hazards identification**

No hazardous product.

**4. First aid measures**

*After inhalation:* Fresh air

*After skin contact:* Wash off with plenty of water.  
Remove contaminated clothing.

*After eye contact:* Rinse out with plenty of water with the eyelid held wide open.

*After ingestion:* If you feel unwell, seek medical advice.

# WTW Safety Data Sheet

## Identification of the substance/preparation

### Reagent C / reducing reagent

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#### 5. Fire-fighting measures

*Suitable extinguishing media:* Water, CO<sub>2</sub>, powder, foam

*Unsuitable extinguishing media:* No information available

*Special risks:* None

*Other information:* Combustible

#### 6. Accidental release measures

*Personal-related precautionary measures:* Avoid substance contact.

*Environmental-protection measures:* Do not allow to enter sewerage system.

*Procedures for cleaning/absorption:* Take up dry. Forward for disposal.  
Clean up affected area with water.

#### 7. Handling and storage

*Handling:* No further requirements.

*Storage:* Tightly closed at +15°C to +25°C.  
Protected from light.

#### 8. Exposure control/personal protection

*Specific control parameters:* None

Personal protective equipment

*Respiratory protection:* Required when dusts are generated.

*Eye protection:* Protective glasses

*Hand protection:* Gloves (nitrile rubber)

*Industrial hygiene:* Wash hands and face after working with substance.  
Change contaminated clothing.

# WTW Safety Data Sheet

## Identification of the substance/preparation

### Reagent C / reducing reagent

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## 9. Physical and chemical properties

<i>Form:</i> Solid	<i>Colour:</i> White	<i>Odour:</i> Odourless
<i>pH-value</i>	ca. 2.2 at 25°C and 50 g/l water	
<i>Melting temperature:</i>	192°C	
<i>Boiling temperature:</i>	°C	
<i>Ignition temperature:</i>	°C	
<i>Flash point:</i>	°C	
<i>Explosion limite lower:</i>	/	
<i>                          upper:</i>	/	
<i>Density:</i>	/	
<i>Solubility in water:</i>	330 g/l at 24°C	
<i>Thermal decomposition:</i>	> 192°C	

## 10. Stability and reactivity

<i>Conditions to be avoided:</i>	Heating and influence of light and air
<i>Substances to be avoided:</i>	Oxidizing agents
<i>Hazardous decomposition products:</i>	No information available.
<i>Further information:</i>	None

## 11. Toxicological information

<i>Acute toxicity:</i>	LD 50 (oral, rat): 11900 mg/kg for ascorbic acid
<i>Further toxicological information:</i>	After eye contact: irritant effect. Noncarcinogenic in animal experiments. Naturally occurring substance.

## 12. Ecological information

<i>Ecotoxic effects:</i>	No ecological problems are to be expected when the product is handled and used with due care and attention. Easily eliminable.
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# WTW Safety Data Sheet

## Identification of the substance/preparation

### Reagent C / reducing reagent

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#### 13. Disposal considerations

*Products:* There are no uniform regulations for the disposal of chemicals or residues. The disposal is regulated through corresponding regional laws and regulations. We recommend that you contact either the authorities in charge or approved waste disposal companies which will advise you on how to dispose the special waste.

*Packaging:* Handle contaminated packaging in the same way as the substance itself. If not officially specified differently, noncontaminated packaging may be treated like household waste or recycled.

#### 14. Transport information

Not subject to transport regulations.

#### 15. Regulatory information

Labelling according to EC directives

*Symbol:* No hazardous product.  
*R-phrases:* /  
*S-phrases:* /

German regulations

Water pollution class WGK: 1 slightly polluting substance  
*Storage class:* 11  
*Regulation on combustible liquids;* VbF: Solid matter, combustible  
*Other regulations:* None

#### 16. Other information

Date of issue: 15.07.2006  
Supersedes edition of 18.02.2004  
Reason for alteration: General update

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

**WTW Safety Data Sheet**  
According to EC Directives 91/155/EEC

**1. Identification of the substance/preparation and of the company/undertaking**

*Product name:*

**Reagent D / color reagent**

**Ord. No.:** 821 095

**Model:** R/P511

*Manufacturer:*

WTW Wissenschaftlich-Technische Werkstätten GmbH, Dr.-Karl-Slevogt-Straße 1, D-82362 Weilheim, Germany, Tel.: +49(0)881 183-0, Fax.: +49(0)881 183-420

Emergency telephone:  
(001)-703-527-3887

**2. Composition/information on ingredients**

*Chemical characterization:* Acid saline solution

<i>Hazardous ingredients:</i>	Sulfuric acid and potassium antimony(III)-oxide tartrate hemihydrate
Sulfuric acid	Potassium antimony(III)oxide tartrate hemihydrate
<i>Hazard symbols:</i> Corrosive (C)	<i>Hazard symbols:</i> Harmful (Xn) and dangerous for the environment (N)
<i>R-phrases:</i> 35	<i>R-phrases:</i> 20-22-51/53
<i>Content:</i> 34 %	<i>Content:</i> 0,06 %
<i>CAS-No.:</i> 7664-93-9	<i>CAS-No.:</i> 28300-74-5
<i>EINECS-No.:</i> 231-639-5	<i>EINECS-No.:</i> 234-293-3
<i>EG-No.:</i> 231-639-5	<i>EG-No.:</i> 234-293-3

**3. Hazards identification**

Causes severe burns. Toxic to aquatic organisms.  
May causes long-term adverse effects in the aquatic environment.

**4. First aid measures**

<i>After inhalation:</i>	Fresh air. Immediately summon doctor.
<i>After skin contact:</i>	Wash off with plenty of water. Remove contaminated clothing.
<i>After eye contact:</i>	Rinse out with plenty of water with the eyelid held wide open. Summon eye specialist.
<i>After ingestion:</i>	Make injured person drink plenty of water, (if necessary several liters). Avoid vomiting. Risk of perforation. Immediately summon doctor. Do not attempt to neutralize.

# WTW Safety Data Sheet

## Identification of the substance/preparation

### Reagent D / color reagent

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#### 5. Fire-fighting measures

<i>Suitable extinguishing media:</i>	Water, CO <sub>2</sub> , foam and powder
<i>Unsuitable extinguishing media:</i>	No information available
<i>Special risks:</i>	Development of dangerous gases and vapours possible in the event of fire (sulfur oxides).
<i>Other information:</i>	Hydrogen may form upon contact with metals (danger of explosion). Use chemical protection clothing and selfcontained breathing apparatus in the dangerous zone. Non-combustible.

#### 6. Accidental release measures

<i>Personal-related precautionary measures:</i>	Do not inhale vapours and aerosols. Avoid contact with eyes and skin.
<i>Environmental-protection measures:</i>	Do not allow to enter sewerage system.
<i>Procedures for cleaning/absorption:</i>	Take up with liquid-absorbent material. Forward for disposal. Clean up affected area with water.

#### 7. Handling and storage

<i>Handling:</i>	No further requirements
<i>Storage:</i>	Tightly closed at +4°C to +8°C.

#### 8. Exposure control/personal protection

<i>Specific control parameters:</i>	MAK-value (Germany): 0.1 mg/m <sup>3</sup> for sulfuric acid MAK-value (Germany): 0,5 mg/m <sup>3</sup> for antimony
Personal protective equipment	
<i>Respiratory protection:</i>	Required when dusts or vapours are generated.
<i>Eye protection:</i>	Protective glasses
<i>Hand protection:</i>	Gloves (nitrile rubber)
<i>Industrial hygiene:</i>	Wash hands and face after working with solution. Change contaminated clothing.

# WTW Safety Data Sheet

## Identification of the substance/preparation

### Reagent D / color reagent

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## 9. Physical and chemical properties

<i>Form:</i> Liquid	<i>Colour:</i> Colourless	<i>Odour:</i> Odourless
<i>pH-value</i>	< 1 at 25°C	
<i>Melting temperature:</i>	°C	
<i>Boiling temperature:</i>	°C	
<i>Ignition temperature:</i>	°C	
<i>Flash point:</i>	°C	
<i>Explosion limite lower:</i>	/	
<i>                                  upper:</i>	/	
<i>Density:</i>	ca. 1.25 g/cm <sup>3</sup>	
<i>Solubility in water:</i>	miscible	
<i>Thermal decomposition:</i>	/	

## 10. Stability and reactivity

<i>Conditions to be avoided:</i>	Strong heating
<i>Substances to be avoided:</i>	Metals (danger of explosion) Alkalis and bases
<i>Hazardous decomposition products:</i>	No information available
<i>Further information:</i>	None

## 11. Toxicological information

<i>Acute toxicity:</i>	LD 50 (oral, rat): 115 mg/kg for potassium antimony(III)oxide tartrate hemihydrate
<i>Further toxicological information:</i>	After inhalation of aerosols: damage to the affected mucous membrane. After skin contact: severe burns. After eye contact: burns, corneal lesions, loss of sight. After swallowing: severe pain, risk of perforation, nausea, vomiting and diarrhoea. After a latency period of several weeks possibly pyloric stenosis.

## 12. Ecological information

<i>Ecotoxic effects:</i>	Toxic for aquatic organisms. Harmful effect due to pH shift. Caustic even in diluted form. May cause long-term adverse effect in the aquatic environment. Do not allow to enter drinking water supplies, waste water, or soil.
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# WTW Safety Data Sheet

## Identification of the substance/preparation

### Reagent D / color reagent

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#### 13. Disposal considerations

- Products:* There are no uniform regulations for the disposal of chemicals or residues. The disposal is regulated through corresponding regional laws and regulations. We recommend that you contact either the authorities in charge or approved waste disposal companies which will advise you on how to dispose the special waste.
- Packaging:* Handle contaminated packaging in the same way as the substance itself. If not officially specified differently, noncontaminated packaging may be treated like household waste or recycled.

#### 14. Transport information

- ADR/GGVSE:* UN 2796, Schwefelsäure, 8 II  
*IMDG/GGVSee:* UN 2796, Sulphuric acid, 8 II, EmS-No.: F-A, S-B  
*ICAO/IATA:* UN 2796, Sulphuric acid, 8 II
- Further information:* None

#### 15. Regulatory information

Labelling according to EC directives

- Symbol:* Corrosive (C)  
*R-phrases:* 35 Causes severe burns.  
*S-phrases:* 26-36/37/39-45 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)

German regulations

- Water pollution class;* WGK: 1 slightly polluting substance  
*Storage class:* 8 B  
*Regulation on combustible liquids;* VbF: Non-combustible  
*Other regulations:* None

#### 16. Other information

- Date of issue: 15.07.2006  
Supersedes edition of 18.02.2004  
Reason for alteration: General update

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.