

## Material Safety Data Sheet

### According to 91/155 EEC

Printing date 12.10.2005








Reviewed on 12.10.2005

#### \* 1 Identification of substance:

- **Product details:** Reagent for water analysis
- **Product name:** COD Reagent 15000 mg/l
- **Catalogue number:** CW/24.20.720
- **Supplier:**  
Camlab Limited  
Camlab House, Norman Way, Over, Cambridge CB4 5WE  
United Kingdom  
Tel: +44 (0)1954 233100
- **Informing department:** Technical Support
- **Emergency information:**  
National Poisons Information Service, United Kingdom  
Tel: 0870 600 6266 (24 hours) • <http://www.npis.org/>

#### \* 2 Composition/Data on components:

- **Description:** sulphuric acid solution
- **Dangerous components:**  
The percent content of the chromium compound mentioned below refers to the amount of the pure chromium therein.  
The percent content of the mercury compound mentioned below refers to the amount of the pure mercury therein.

CAS: 7664-93-9 EINECS: 231-639-5 EC Number: 016-020-00-8	sulphuric acid  C; R 35	60-70%
CAS: 7783-35-9 EINECS: 231-992-5 EC Number: 080-002-00-6	mercury sulphate  T+,  N; R 26/27/28-33-50/53	0.1-1.0%
CAS: 7778-50-9 EINECS: 231-906-6 EC Number: 024-002-00-6	potassium dichromate Carc. Cat. 2, Muta. Cat. 2, Repr. Cat. 2;  T+,  O,  N; R 45-46-60-61-8-21-25-26-34-42/43-48/23-50/53	0.1-1.0%
CAS: 10294-26-5 EINECS: 233-653-7	disilver(1+) sulphate  Xi; R 41	0.1-1.0%

- **Additional information** For the wording of the listed risk phrases refer to section 16.

#### 3 Hazards identification

- **Hazard designation:**



T Toxic  
C Corrosive

- **Information pertaining to particular dangers for man and environment**

The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

Avoid exposure - obtain special instructions before use.

R 45 May cause cancer.

R 46 May cause heritable genetic damage.

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

(Contd. on page 2)

# Material Safety Data Sheet

## According to 91/155 EEC

Printing date 12.10.2005

Reviewed on 12.10.2005

---

**Product name: COD Reagent 15000 mg/l**

---

(Contd. of page 1)

R 33 Danger of cumulative effects.

R 35 Causes severe burns.

R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Restricted to professional users.

**Classification system**

The classification is in line with current EC lists. It is expanded, however, by information from technical literature and by information furnished by supplier companies.

---

### 4 First aid measures

**General information**

Instantly remove any clothing soiled by the product.

Remove breathing apparatus only after soiled clothing has been completely removed.

In case of irregular breathing or respiratory arrest provide artificial respiration.

**After inhalation**

Supply fresh air or oxygen; call for doctor.

In case of unconsciousness bring patient into stable side position for transport.

**After skin contact**

Instantly wash with polyethylene glycol 400.

Instantly wash with water and soap and rinse thoroughly.

Immediate medical treatment necessary. Failure to treat burns can prevent wounds from healing.

**After eye contact**

Rinse opened eye for several minutes under running water.

Call a doctor immediately.

**After swallowing**

Do not induce vomiting; instantly call for medical help.

Rinse out mouth and then drink plenty of water.

**The following symptoms may occur:**

after inhalation:

coughing

breathing difficulty

damage to the affected mucous membranes

after swallowing:

unconsciousness

pain

Strong caustic effect.

diarrhoea

metallic taste

**Danger**

Danger of system failure.

Danger of impaired breathing.

**Treatment**

If swallowed or in case of vomiting, danger of entering the lungs

Subsequent observation for pneumonia and pulmonary oedema

### 5 Fire fighting measures

**Suitable extinguishing agents** CO<sub>2</sub>, sand, extinguishing powder. Do not use water.**For safety reasons unsuitable extinguishing agents** Water.**Special hazards caused by the material, its products of combustion or resulting gases:**

Formation of toxic gases is possible during heating or in case of fire.

nitrous gases

Sulphur oxides (SO<sub>x</sub>)

mercury vapours

hydrogen

**Protective equipment:**

Wear full protective suit.

(Contd. on page 3)

# Material Safety Data Sheet

## According to 91/155 EEC

Printing date 12.10.2005

Reviewed on 12.10.2005

---

**Product name: COD Reagent 15000 mg/l**


---

(Contd. of page 2)

Wear self-contained breathing apparatus.

- **Additional information**

Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

Collect contaminated fire fighting water separately. It must not enter drains.

---



---

### 6 Accidental release measures

- **Person-related safety precautions:**

Ensure adequate ventilation

Wear protective equipment. Keep unprotected persons away.

- **Measures for environmental protection:**

Do not allow product to reach sewage system or water bodies.

Inform respective authorities in case product reaches water or sewage system.

- **Measures for cleaning/collecting:**

Ensure adequate ventilation.

Neutralize with diluted sodium hydroxide solution or by throwing on lime sand, lime or sodium carbonate.

Absorb with liquid-binding material (sand, diatomite, universal binders).

Dispose of contaminated material as waste according to item 13.

---



---

### 7 Handling and storage

- **Handling**

- **Information for safe handling:**

Ensure good ventilation/exhaustion at the workplace.

Open and handle container with care.

Prevent formation of aerosols.

Work only in fume cupboard.

- **Information about protection against explosions and fires:**

Keep breathing equipment ready.

The product is not flammable

- **Storage**

- **Requirements to be met by storerooms and containers:** Store in cool location.

- **Information about storage in one common storage facility:**

Store away from oxidizing agents.

Store away from metals.

- **Further information about storage conditions:**

Keep container tightly sealed.

Protect from heat and direct sunlight.

Protect from humidity and keep away from water.

This product is hygroscopic.

Protect from the effects of light.

- **Storage class** Not required.

---



---

### 8 Exposure controls and personal protection

- **Additional information about design of technical systems:** No further data; see item 7.

- **Components with limit values that require monitoring at the workplace:**

<b>7783-35-9 mercury sulphate</b>	
OES (Great Britain)	Long-term value: 0.025 mg/m <sup>3</sup> Bmgv
<b>7778-50-9 potassium dichromate</b>	
MEL (Great Britain)	Long-term value: 0.05 mg/m <sup>3</sup> as Cr

(Contd. on page 4)

# Material Safety Data Sheet

## According to 91/155 EEC

Printing date 12.10.2005

Reviewed on 12.10.2005

---

**Product name: COD Reagent 15000 mg/l**


---

(Contd. of page 3)

- **Additional information:** The lists that were valid during the compilation were used as basis.
  - **Personal protective equipment**
  - **General protective and hygienic measures**  
 Keep away from foodstuffs, beverages and food.  
 Take off immediately all contaminated clothing  
 Wash hands during breaks and at the end of the work.  
 Store protective clothing separately.  
 Avoid contact with the eyes and skin.  
 Do not eat, drink or smoke while working.
  - **Breathing equipment:**  
 In case of brief exposure or low pollution use breathing filter apparatus. In case of intensive or longer exposure use breathing apparatus that is independent of circulating air.
  - **Recommended filter device for short term use:** Filter B
  - **Protection of hands:**  
 Acid resistant gloves  
 Only use chemical-protective gloves with CE-labelling of category III.  
 The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.  
 Preventive skin protection by use of skin-protecting agents is recommended.  
 After use of gloves apply skin-cleaning agents and skin cosmetics.
  - **Material of gloves**  
 The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.  
 Fluorocarbon rubber (Viton)  
 Recommended thickness of the material:  $\geq 0.7$  mm
  - **Penetration time of glove material**  
 The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.  
 Value for the permeation: Level  $\geq 6$  (480 min)
  - **Eye protection:** Tightly sealed safety glasses.
  - **Body protection:** Acid resistant protective clothing
- 

### 9 Physical and chemical properties:

· <b>Form:</b>	Fluid
· <b>Colour:</b>	Yellow-brown
· <b>Odour:</b>	Recognizable
· <b>Melting point/Melting range:</b>	Not applicable
· <b>Boiling point/Boiling range:</b>	Not determined
· <b>Flash point:</b>	Not applicable
· <b>Danger of explosion:</b>	Product is not explosive.
· <b>Density at 20°C</b>	1.579 g/cm <sup>3</sup>
· <b>Solubility in / Miscibility with Water:</b>	Fully miscible
· <b>pH-value at 20°C:</b>	1
· <b>Solvent content:</b>	
<b>Organic solvents:</b>	0.0 %
<b>Water:</b>	< 40 %
· <b>Solids content:</b>	< 1 %

---

— GB —

(Contd. on page 5)

# Material Safety Data Sheet

## According to 91/155 EEC

Printing date 12.10.2005

Reviewed on 12.10.2005

**Product name: COD Reagent 15000 mg/l**

### 10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:** strong heating
- **Materials to be avoided:**
  - organic substances
  - ammonia
  - alkali compounds
  - alkalis
  - acids
  - metals
  - halogen compounds
  - combustible substances
  - organic solvents
  - nitriles
  - peroxides
  - reducing agents
  - oxidizing agents
- **Dangerous reactions**
  - Corrosive action on metals
  - When diluting, always add acid to water, never vice versa
  - Reacts with metals forming hydrogen
  - Reacts with organic substances
  - Diluting or dissolving in water always causes rapid heating
  - Forms hydrogen in aqueous solution with metals
  - > Explosive
- **Dangerous products of decomposition:**
  - nitrous gases
  - Sulphur oxides (SO<sub>x</sub>)
  - see chapter 5

### 11 Toxicological information

- **Acute toxicity:** Quantitative data on the toxicity of the preparation are not available.

- **LD/LC50 values that are relevant for classification:**

7664-93-9 sulphuric acid		
Oral	LD50	2140 (25%) mg/kg (rat)
Inhalative	LC 50	510 (pure) mg/m <sup>3</sup> /2h (rat)
7783-35-9 mercury sulphate		
Oral	LD50	57 mg/kg (rat)
Dermal	LD50	625 mg/kg (rat)
7778-50-9 potassium dichromate		
Oral	LD50	25 mg/kg (rat)
	LDLo	26 mg/kg (child)
		143 mg/kg (man)
Dermal	LD50	1170 mg/kg (rat)
Inhalative	LC50/4 h	0.094 mg/l (rat)
	LD50 IPR	28 mg/kg (rat)

- **Primary irritant effect:**
  - on the skin:** Strong caustic effect on skin and mucous membranes.
  - on the eye:** Strong caustic effect.
- **Sensitization:** No sensitizing effect known.
- **Experience with humans:**
  - Can cause kidney damages.
  - Can cause liver damages.

(Contd. on page 6)

# Material Safety Data Sheet

## According to 91/155 EEC

Printing date 12.10.2005

Reviewed on 12.10.2005

---

**Product name: COD Reagent 15000 mg/l**


---

(Contd. of page 5)

**Additional toxicological information:**

The product shows the following dangers according to the calculation method of the General EC Classification Guidelines for Preparations as issued in the latest version:

Toxic

Corrosive

Danger by skin resorption.

Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

Carcinogenic

The product can cause inheritable damage.

Mercury compounds have a cytotoxic and protoplasmatoxic effect.

The principal signs manifest themselves in the CNS.

## 12 Ecological information:

**Information about elimination (persistence and degradability):**
**Other information:**

Quantitative data on the ecological effect of this product are not available.

Does not cause biological oxygen deficit.

**Ecotoxic effects:**
**Aquatic toxicity:**

The following applies to the water-soluble matter contained in inorganic Hg compounds in general:

The toxicity of mercury(II) ions for water organism depends on the water hardness (IPCS).

<b>7664-93-9 sulphuric acid</b>	
Daphnia EC50	29 mg/l/24h (Daphnia magna)
<b>7783-35-9 mercury sulphate</b>	
EC50	0.005-3.6 mg/l/48h (Daphnia magna)
LC50	0.5 mg/l/48h (Leuciscus idus)
	0.19 mg/l/96h (Pimephales promelas)
<b>7778-50-9 potassium dichromate</b>	
EC50	0.035 mg/l/48h (Daphnia magna)
LC50	58.5 mg/l/96h (Brachydanio rerio)
	160 mg/l/96h (Poecilia reticulata)
	25-150 mg/l/96h (Pimephales promelas)

**Remark:**

Toxic for fish:

sulphates &gt; 7 g/l

Forms corrosive mixtures with water even if diluted.

Harmful to aquatic organisms

Toxic for algae

**Algal toxicity:** CAS-No. 7778-50-9: Chlorella vulgaris IC50: 0.16 - 0.59 mg/l/96 h

**Bacterial toxicity:** CAS-No. 7778-50-9: Photobacterium phosphoreum EC50: 58 mg/l/30 min Microtox-Test (MERCK)

**Remark:** neutralization possible

**General notes:**

Water danger class 3 (German Regulation) (Self-assessment acc. VwVwS Annex 4): extremely hazardous for water.

Do not allow product to reach ground water, water bodies or sewage system, even in small quantities.

Danger to drinking water if even extremely small quantities leak into soil.

## 13 Disposal considerations

**Product:**
**Recommendation** Hand over to disposers of hazardous waste.

(Contd. on page 7)

# Material Safety Data Sheet

## According to 91/155 EEC

Printing date 12.10.2005

Reviewed on 12.10.2005

**Product name: COD Reagent 15000 mg/l**

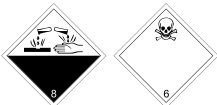
(Contd. of page 6)

**· European waste catalogue**

16 05 07 | discarded inorganic chemicals consisting of or containing dangerous substances

**· Uncleaned packagings:**
**· Recommendation:** Disposal must be made according to official regulations.

### 14 Transport information

**· Land transport ADR/RID (cross-border)**

**· ADR/RID-GGVS/E Class:** 8 (CT1) Corrosive substances.

**· Kemler Number:** 86

**· UN-Number:** 2922

**· Packaging group:** II

**· Label:** 8+6.1

**· Designation of goods:** 2922 CORROSIVE LIQUID, TOXIC, N.O.S. (SULPHURIC ACID, MERCURY SULPHATE)

**· Maritime transport IMDG:**

**· IMDG Class:** 8

**· UN Number:** 2922

**· Label:** 8+6.1

**· Packaging group:** II

**· EMS Number:** F-A,S-B

**· Marine pollutant:** No

**· Correct technical name:** CORROSIVE LIQUID, TOXIC, N.O.S. (SULPHURIC ACID, MERCURY SULPHATE)

**· Air transport ICAO-TI and IATA-DGR:**

**· ICAO/IATA Class:** 8

**· UN/ID Number:** 2922

**· Label:** 8+6.1

**· Packaging group:** II

**· Correct technical name:** CORROSIVE LIQUID, TOXIC, N.O.S. (SULPHURIC ACID, MERCURY SULPHATE)

### \*15 Regulatory information

**· Designation according to EC guidelines:**

The product has been classified and labelled in accordance with EC Directives / Ordinance on Hazardous Materials (GefStoffV)

**· Code letter and hazard designation of product:**

T Toxic

C Corrosive

**· Hazard-determining components of labelling:**

potassium dichromate

mercury sulphate

(Contd. on page 8)

# Material Safety Data Sheet

## According to 91/155 EEC

Printing date 12.10.2005

Reviewed on 12.10.2005

---

**Product name: COD Reagent 15000 mg/l**

---

(Contd. of page 7)

sulphuric acid

**· Risk phrases:**

- 45 May cause cancer.
- 46 May cause heritable genetic damage.
- 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.
- 33 Danger of cumulative effects.
- 35 Causes severe burns.
- 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**· Safety phrases:**

- 53 Avoid exposure - obtain special instructions before use.
- 4 Keep away from living quarters.
- 9 Keep container in a well-ventilated place.
- 20 When using do not eat or drink.
- 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
- 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

**· Special designation of certain preparations:**

- Restricted to professional users.
  - Contains potassium dichromate. May produce an allergic reaction.
- 

## 16 Other information

These data are based on our present knowledge. However, they shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

**· Relevant R-phrases**

- 21 Harmful in contact with skin.
- 25 Toxic if swallowed.
- 26 Very toxic by inhalation.
- 26/27/28 Very toxic by inhalation, in contact with skin and if swallowed.
- 33 Danger of cumulative effects.
- 34 Causes burns.
- 35 Causes severe burns.
- 41 Risk of serious damage to eyes.
- 42/43 May cause sensitisation by inhalation and skin contact.
- 45 May cause cancer.
- 46 May cause heritable genetic damage.
- 48/23 Toxic: danger of serious damage to health by prolonged exposure through inhalation.
- 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- 60 May impair fertility.
- 61 May cause harm to the unborn child.
- 8 Contact with combustible material may cause fire.

**· Department issuing data specification sheet:** Technical Department**· \* Data compared to the previous version altered.**