Material Safety Data Sheet
According to 91/155 EEC

Reviewed on 22.02.2005

* 1 Identification of substance:

· **Product details:** Reagent for water analysis

· **Product name:** **COD-25 Cuvettes Medium Range (0-1500 mg/l/ppm/COD/ CSB)**

· **Catalog number: 251 991** **Model: COD2 TC (MR)**

· **Supplier:**
WTW Wissenschaftlich-Technische Werkstätten GmbH
Dr.-Karl-Slevogt-Straße 1
D-82362 Weilheim
Fax: +49(0)881 183-420
Tel.: +49(0)881 183-0
Tel: +49(0)881 183-100
Internet: http://www.WTW.com
E-Mail: Info@WTW.com

· **Emergency information:**
Poison Center Berlin, Germany
Tel.: +49(0)30 19240

* 2 Composition/Data on components:

· **Description:** sulfuric 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	80-90%
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%

* 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.
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.
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.

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· **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**
Personal protection for the First Aider!
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.
Drink copious amounts of water and provide fresh air. Instantly call for doctor.
· **The following symptoms may occur:**
after inhalation:
damage to the affected mucous membranes
coughing
breathing difficulty
after swallowing:
pain
Strong caustic effect.
unconsciousness
bloody diarrhoea
metallic taste
· **Danger**
Danger of system failure.
Danger of gastric perforation.
· **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_2, 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:**
Development of hazardous combustion gases or vapours possible in the event of fire.
nitrous gases
Sulphur oxides (SOx)
mercury vapours
hydrogen
· **Protective equipment:**
Wear full protective suit.
Wear self-contained breathing apparatus.
· **Additional information**
Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

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

* 6 Accidental release measures

· **Person-related safety precautions:**
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Use breathing protection against the effects of fumes/dust/aerosol.
· **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:**
Protect from heat.
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 metals.
· **Further information about storage conditions:**
Keep container tightly sealed.
Store under dry conditions.
This product is hygroscopic.
Protect from humidity and keep away from water.
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.

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· **Components with limit values that require monitoring at the workplace:**
7778-50-9 Potassium dichromate
EG:
Sensitization Sah:
Danger of sensitization of the airways and the skin
Carcinogenic C2:
Should be regarded as if it is carcinogenic to man
Mutagenic M2:
Substance which should be regarded as if mutagenic to man
Fertility R(F)2:
Should be regarded as if impairing fertility in humans
Embryotoxic R(E)2:
Should be regarded as if it impaire developmental toxicity

7783-35-9 mercury sulphate	
OES (Great Britain)	Long-term value: 0.025 mg/m³ Bmgv
7778-50-9 potassium dichromate	
MEL (Great Britain)	Long-term value: 0.05 mg/m³ as Cr

· **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.
Do not inhale gases / fumes / aerosols.
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 P3
· **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.
Butyl rubber, BR
Fluorocarbon rubber (Viton)
Recommended thickness of the material: ≥ 0.7 mm
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
Value for the permeation: Level ≥ 6 (480 min)
· **Eye protection:** Tightly sealed safety glasses.
· **Body protection:** Acid resistant protective clothing

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9 Physical and chemical properties:

· **Form:**	Fluid

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· **Colour:**	Yellow-brown
· **Odour:**	Recognizable
· **Melting point/Melting range:**	Not applicable
· **Boiling point/Boiling range:**	Not determined
· **Flash point:**	Not applicable
· **Self-inflammability:**	Product is not selfigniting.
· **Danger of explosion:**	Product is not explosive.
· **Density at 20°C**	1.758 g/cm³
· **Solubility in / Miscibility with Water:**	Fully miscible
· **pH-value at 20°C:**	~ 1
· **Solvent content:**	
Organic solvents:	0.0 %
Water:	< 20 %
· **Solids content:**	< 1 %

* 10 Stability and reactivity

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

* 11 Toxicological information

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

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· **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/m³/2h (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:**
Sensitization possible by inhalation.
Sensitization possible by skin contact.
· **Experience with humans:** Can cause kidney damages.
· **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
Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.
Carcinogenic if inhaled.
Product is suspected to cause injury to foetus.
Danger by skin resorption.
The product can cause inheritable damage.
Mercury compounds have a cytotoxic and protoplasmatoxic effect.
The principal signs manifest themselves in the CNS.
Inhalable chromium (VI) compounds have claerly shown themselves to be carcinogenic in animal experiments.
Poor tendency for ulcers to heal following penetration of substance into the wound.
Lethal dose (man): 0.5 g
Antidotes: chelating agents such as EDTA, DMPS

* 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 biolocigal oxygen deficit.
· **Ecotoxical effects:**
· **Acquatic 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).

7664-93-9 sulphuric acid	
Daphnia EC50	29 mg/l/24h (Daphnia magna)
7783-35-9 mercury sulphate	
EC50	0.005-3.6 mg/l/48h (Daphnia magna)

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LC50	0.5 mg/l/48h (Leuciscus idus)
	0.19 mg/l/96h (Pimephales promelas)
7778-50-9 potassium dichromate	
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:**
Forms corrosive mixtures with water even if diluted.
Toxic for algae
Toxic for fish:
sulphates > 7 g/l
High aquatic toxicity.
· **Algeal 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): 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.
Rinse off of bigger amounts into drains or the aquatic environment may lead to decreased pH-values. A low pH-value harms aquatic organisms.

* 13 Disposal considerations

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

· **European waste catalogue**	
16 05 07	discarded inorganic chemicals consisting of or containing dangerous substances
16 09 02	chromates, for example potassium chromate, potassium or sodium dichromate

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.
· **Recommended cleaning agent:** Water, if necessary with cleaning agent.

* 14 Transport information

· ADR/GGVSE: UN 3316 CHEMIE-TESTSATZ, 9, II

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· **IMDG/GGVSee:** UN 3316 CHEMICAL KIT, 9, II EMS-Number: F-A S-P

· **ICAO/IATA:** CHEMICAL KIT, 9, UN 3316, II

* 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

· **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.

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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.
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:** Department TSS, Dr. Manfred Kaul
· **Data compared to the previous version altered.**