

Safety Data Sheet

According to EC Directive 91/155/EEC

Date of issue: 13.01.2005
Supersedes edition of 18.03.2004

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

Identification of the product

Catalogue No.: 109773
Product name: COD Cell Test (Hg-free) Method: photometric 100 - 1500 mg/l 25
Tests Spectroquant®
Reaktionsküvette

Use of the substance/preparation

Reagent for analysis

Company/undertaking identification

Company: Merck KGaA * 64271 Darmstadt * Germany * Tel: +49 (0)6151/72-0
Emergency telephone No.: +49 (0)6151/722440 * Fax: +49 (0)6151/72-7780

2. Composition/information on ingredients

Sulfuric acid solution.

The percent content of the chromium compound mentioned below refers to the amount of the pure chromium therein.

Hazardous ingredients:

Name according to EC Directives:

CAS-No.	EC No.	EC-Index-No.	Classification	Content:
7778-50-9	231-906-6	024-002-00-6	O; R8 Carc. Cat. 2; R45 Repr. Cat. 2; R60-61 Muta. Cat. 2; R46 T+; R26 T; R25-48/23 Xn; R21-42/43 C; R34 N; R50/53	≥ 0.2 - < 0.25 %
7664-93-9	231-639-5	016-020-00-8	C; R35	≥ 50 %

(Full text of R-Phrases in heading 16)

3. Hazards identification

May cause cancer. May cause heritable genetic damage. Also harmful by inhalation. Causes severe burns. May cause sensitization by inhalation and skin contact.

Restricted to professional users. Attention -
Avoid exposure - obtain special instructions before use.

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 109773
Product name: COD Cell Test (Hg-free) Method: photometric 100 - 1500 mg/l 25 Tests
Spectroquant®
Reaktionsküvette

4. First aid measures

First-aid personnel: ensure self-protection!

After inhalation: fresh air. Call in physician.

After skin contact: wash off with plenty of water. Dab with polyethylene glycol 400.

Immediately remove contaminated clothing.

After eye contact: rinse out with plenty of water for at least 10 minutes with the eyelid held wide open. Immediately call in ophthalmologist.

After swallowing: make victim drink plenty of water (if necessary several litres), avoid vomiting (risk of perforation!). Immediately call in physician. Do not attempt to neutralize.

5. Fire-fighting measures

Suitable extinguishing media:

In adaption to materials stored in the immediate neighbourhood.

Special risks:

Non-combustible. Ambient fire may liberate hazardous vapours.

The following may develop in event of fire: sulfur oxides.

Special protective equipment for fire fighting:

Do not stay in dangerous zone without self-contained breathing apparatus. In order to avoid contact with skin, keep a safety distance and wear suitable protective clothing.

Other information:

Cool container with spray water from a safe distance. Prevent fire-fighting water from entering surface water or groundwater. Contain escaping vapours with water.

6. Accidental release measures

Person-related precautionary measures:

Do not inhale vapours/aerosols. Avoid substance contact. Ensure supply of fresh air in enclosed rooms.

Environmental-protection measures:

Do not allow to enter sewerage system.

Procedures for cleaning / absorption:

Take up with liquid-absorbent and neutralizing material (e.g. Chemisorb® H⁺, Art. No. 101595). Forward for disposal. Clean up affected area.

7. Handling and storage

Handling:

Notes for safe handling:

Work under hood. Do not inhale substance. Avoid generation of vapours/aerosols.

Storage:

Tightly closed in a well-ventilated place. Accessible only for authorised persons. At +15°C to +25°C.

The data apply to the entire pack.

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 109773
Product name: COD Cell Test (Hg-free) Method: photometric 100 - 1500 mg/l 25 Tests Spectroquant®
Reaktionsküvette

8. Exposure controls/personal protection

Specific control parameter

EC

Name	potassium dichromate
Carcinogenic	C 2:should be regarded as if it is carcinogenic to man
mutagenic	M 2: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
Sensitization	Sah Danger of sensitization of the airways and the skin

TRGS 900

Name	Chromium (VI) compounds (as dusts/aerosoles)
Kind of use	others
Value	0.05 mg/m ³ inhalable fraction. Calculated as CrO ₃ in total dust.
Peak limit	4 exceeding factor: 4-fold in 15 minutes

Name	Sulfuric acid
Kind of use	others
Value	0.1 mg/m ³ Inhalable fraction. The following regulation applies to the peak limit: short-term exposure duration: max. 15 minutes as mean value, frequency per shift: 4, time interval: min. 1 hour

Peak limit	1 Concentration must not exceed limit concentration.
Embryotoxic	Y Substances with which no foetotoxic risk is to be expected when observing the maximum allowable concentration (MAC Germany) and the biological tolerance value at the workplace (BAT Germany).

Personal protective equipment:

Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.

Respiratory protection: required when vapours/aerosols are generated.

Eye protection: required

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 109773
Product name: COD Cell Test (Hg-free) Method: photometric 100 - 1500 mg/l 25 Tests Spectroquant® Reaktionsküvette

Hand protection: In full contact:
Glove material: viton
Layer thickness: 0.70 mm
Breakthrough time: > 480 Min.
In splash contact:
Glove material: butyl rubber
Layer thickness: 0.7 mm
Breakthrough time: > 120 Min.

The protective gloves to be used must comply with the specifications of EC directive 89/686/EEC and the resultant standard EN374, for example KCL 890 Vitoject® (full contact), 898 Butoject® (splash contact). The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.

This recommendation applies only to the product stated in the safety data sheet and supplied by us as well as to the purpose specified by us. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Other protective equipment: Acid-resistant protective clothing.

Industrial hygiene: Change contaminated clothing and immerse in water. Apply skin-protective barrier cream. Wash hands and face after working with substance. Work under hood. Do not inhale substance. Under no circumstances eat or drink at workplace.

9. Physical and chemical properties

Form:	liquid	
Colour:	orange red	
Odour:	odourless	
pH value	(20 °C)	< 1
Melting point		not available
Boiling point		not available
Ignition temperature		not available
Flash point		not available
Explosion limits	lower	not available
	upper	not available
Density		not available
Solubility in water	(20 °C)	soluble (caution ! development of heat)

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 109773
Product name: COD Cell Test (Hg-free) Method: photometric 100 - 1500 mg/l 25 Tests
Spectroquant®
Reaktionsküvette

10. Stability and reactivity

Conditions to be avoided

Strong heating.

Substances to be avoided

Violent reactions possible with:

water, alkali metals, alkali compounds, ammonia, alkaline earth metals, alkaline earth compounds, alkalis, acids, metals, metal alloys, phosphorus, phosphorus oxides, hydrides, halogen-halogen compounds, oxyhalogenic compounds, permanganates, nitrates, carbides, combustible substances, organic solvents, acetylidene, nitriles, organic nitro compounds, anilines, peroxides, picrates, nitrides, lithium silicide.

Hazardous decomposition products

in the event of fire: See chapter 5.

Further information

hygroscopic; has a corrosive effect;
incompatible with animal/vegetable tissues, metals.
Hydrogen may form upon contact with metals (danger of explosion!).

11. Toxicological information

Acute toxicity

Quantitative data on the toxicity of this product are not available.

Subacute to chronic toxicity

Applicable to partial component(s):

Animal experiments performed under conditions comparable with the workplace situation have shown the substance to be carcinogenic.

Based on clear evidence from animal experiments there is a high risk of teratogenic effects.

Pregnant women must not be exposed to the product.

There is sufficient evidence to assume that reproductive performance in man is impaired. These properties have been clearly demonstrated in animal experiments.

A mutagenic effect has been demonstrated in animal studies on mammals, justifying the assumption that exposure of humans to the substance produces hereditary damage.

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 109773
Product name: COD Cell Test (Hg-free) Method: photometric 100 - 1500 mg/l 25 Tests Spectroquant®
Reaktionsküvette

Further toxicological information

Applicable to the main component:

After inhalation of aerosols: damage to the affected mucous membranes.
After skin contact: severe burns with formation of scabs.
After eye contact: burns, corneal lesions.
After swallowing: severe pain (risk of perforation!), nausea, vomiting and diarrhoea.
After a latency period of several weeks possibly pyloric stenosis.

Applicable to partial component(s):

After inhalation: Risk of airways sensitization.
After skin contact: Risk of skin sensitization.

Other notes:

Chromium (VI) is highly toxic. It is absorbed via both the lungs as well as the gastrointestinal tract. Being strong oxidants, chromates/ bichromates can cause burns and ulcerations on the skin and mucous membranes and also irritations in the upper respiratory tract. Poor tendency for ulcers to heal following penetration of substance into the wound. In predisposed persons the substance rapidly leads to sensitization and allergic reactions of the respiratory tract (risk of pneumonia!) and damage to nasal mucous membranes (under given circumstances perforation of the septum). After swallowing severe symptoms in the gastrointestinal tract such as bloody diarrhoea, vomiting (aspiration pneumonia!) spasms, circulatory collapse, unconsciousness, formation of methaemoglobin. Absorption may result in hepatic and renal damage. Inhalable chromium(VI) compounds have clearly shown themselves to be carcinogenic in animal experiments. Lethal dose (man): 0.5 g. Antidotes: chelating agents such as EDTA, DMPS (Demaval(R)).

Further data

Further hazardous properties cannot be excluded.
This substance should be handled with particular care.

12. Ecological information

Ecotoxic effects:

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

Further ecologic data:

The following applies to sulfuric acid: biological effects: harmful effect on aquatic organisms. Harmful effect due to pH shift. Toxic effect on fish and algae. Caustic even in diluted form. Does not cause biological oxygen deficit. Endangers drinking-water supplies if allowed to enter soil and/or waters in large quantities. Neutralization possible in waste water treatment plants.

Daphnia toxicity: Daphnia magna EC₅₀: 29 mg/l/24 h (calculated on the pure substance).

The following applies to chromium ions in general: biological effects: fish: toxic from 52 mg/l up; LC₅₀: 29 mg/l; algae: toxic from 5 mg/l up; arthropods: Daphnia toxic from 0.32 mg/l up, calculated as sodium chromate.

Do not allow to enter waters, waste water, or soil!

13. Disposal considerations

Product:

Chemicals must be disposed of in compliance with the respective national regulations. Under www.retrologistik.de you will find country- and substance-specific information as well as contact partners.

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 109773
Product name: COD Cell Test (Hg-free) Method: photometric 100 - 1500 mg/l 25 Tests Spectroquant®
Reaktionsküvette

Packaging:

Merck product packaging must be disposed of in compliance with the country-specific regulations or must be passed to a packaging return system. Under www.retrologistik.de you will find special information on the respective national conditions as well as contact partners.

14. Transport information

Road & Rail ADR, RID
UN 3316 CHEMIE-TESTSATZ, 9, II

Inland waterway ADN, ADNR not tested

Sea IMDG-Code
UN 3316 CHEMICAL KIT, 9, II
Ems F-A S-P

Air CAO, PAX
CHEMICAL KIT, 9, UN 3316, II

The transport regulations are cited according to international regulations and in the form applicable in Germany. Possible national deviations in other countries are not considered.
THESE TRANSPORT DATA APPLY TO THE ENTIRE PACK !

15. Regulatory information

Labelling according to EC Directives

Symbol:	T	Toxic
R-phrases:	45-46-20-35-42/43	May cause cancer. May cause heritable genetic damage. Also harmful by inhalation. Causes severe burns. May cause sensitization by inhalation and skin contact.
S-phrases:	53-26-36/37/39-45	Avoid exposure - obtain special instructions before use. 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).
contains:	potassium dichromate Sulphuric acid	

German regulations

Water pollution class	3	(highly polluting substance) VwVwS Anh. 4
Storage class VCI	6.1 B	
Data sheet of the Chemical Professional Association	M004 Irritant substances/corrosive substances M051 Dangerous chemical substances M056 Safe biotechnology laboratories - Equipment and standard practices.	

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 109773
Product name: COD Cell Test (Hg-free) Method: photometric 100 - 1500 mg/l 25 Tests
Spectroquant®
Reaktionsküvette

The employment restrictions for young workers in accordance with section 22 of the Youth Employment Protection Law (JArbSchG) are to be observed.

The employment restrictions for expectant and nursing mothers in accordance with sections 4 and 5 of the Maternity Protection Guideline (MuSchRiV) are to be observed.

16. Other information

Text of any R phrases referred to under heading 2:

- | | |
|-------|--------------------------------------------------------------------------------------------------|
| 8 | Contact with combustible material may cause fire. |
| 21 | Harmful in contact with skin. |
| 25 | Toxic if swallowed. |
| 26 | Very toxic by inhalation. |
| 34 | Causes burns. |
| 35 | Causes severe burns. |
| 42/43 | May cause sensitization 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. |

Reduced labelling on the container due to small quantity.

Reason for alteration

Chapter 2: change in ingredients data.

Chapter 8: specific control parameter.

Chapter 11: toxicological information.

Chapter 12: ecological information.

Chapter 15: labelling.

Chapter 15: change in water pollution class.

General update.

Contact for information:

HSSE-C/CI * Tel: +49 (0)6151/722775 * Fax: +49 (0)6151/726433 * e-mail:prodsafe@merck.de

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.

Safety Data Sheet

According to EC Directive 91/155/EEC

Date of issue: 13.01.2005
Supersedes edition of 18.03.2004

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

Identification of the product

Catalogue No.: 109773
Product name: COD Cell Test (Hg-free) Method: photometric 100 - 1500 mg/l 25
Tests Spectroquant®
Blindwertküvette

Use of the substance/preparation

Reagent for analysis

Company/undertaking identification

Company: Merck KGaA * 64271 Darmstadt * Germany * Tel: +49 (0)6151/72-0
Emergency telephone No.: +49 (0)6151/722440 * Fax: +49 (0)6151/72-7780

2. Composition/information on ingredients

Aqueous solution of organic compounds.

3. Hazards identification

No hazardous product as specified in Directive 67/548/EEC.

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 swallowing: make victim drink plenty of water. Consult doctor if feeling unwell.

5. Fire-fighting measures

Suitable extinguishing media:
In adaption to materials stored in the immediate neighbourhood.

Special risks:
Non-combustible.

6. Accidental release measures

Person-related precautionary measures:
Do not inhale vapours/aerosols.

Procedures for cleaning / absorption:
Take up with liquid-absorbent material (e.g. Chemizorb®). Forward for disposal. Clean up affected area.

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 109773
Product name: COD Cell Test (Hg-free) Method: photometric 100 - 1500 mg/l 25 Tests
Spectroquant®
Blindwertküvette

7. Handling and storage

Handling:

No further requirements.

Storage:

Tightly closed in a well-ventilated place. Accessible only for authorised persons. At +15°C to +25°C.

The data apply to the entire pack.

8. Exposure controls/personal protection

Personal protective equipment:

Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.

Respiratory protection: required when vapours/aerosols are generated.

Eye protection: required

Hand protection: In full contact:
Glove material: nitrile rubber
Layer thickness: 0.11 mm
Breakthrough time: > 480 Min.
In splash contact:
Glove material: nitrile rubber
Layer thickness: 0.11 mm
Breakthrough time: > 480 Min.

The protective gloves to be used must comply with the specifications of EC directive 89/686/EEC and the resultant standard EN374, for example KCL 741 Dermatril® L (full contact), 741 Dermatril® L (splash contact).

This recommendation applies only to the product stated in the safety data sheet and supplied by us as well as to the purpose specified by us. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Industrial hygiene:

Change contaminated clothing. Wash hands after working with substance.

9. Physical and chemical properties

Form: liquid
Colour: light blue
Odour: odourless
pH value (25 °C) ~ 7
Melting point not available

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 109773
Product name: COD Cell Test (Hg-free) Method: photometric 100 - 1500 mg/l 25 Tests
Spectroquant®
Blindwertküvette

Boiling point		not available
Ignition temperature		not available
Flash point		not available
Explosion limits	lower	not available
	upper	not available
Density	(20 °C)	1.00 g/cm ³
Solubility in water	(25 °C)	soluble

10. Stability and reactivity

Conditions to be avoided

no information available

Substances to be avoided

The generally known reaction partners of water.

Hazardous decomposition products

not known to date

11. Toxicological information

Acute toxicity

Quantitative data on the toxicity of this product are not available.

Further toxicological information

No toxic effects are to be expected when the product is handled appropriately.

Further data

The product should be handled with the care usual when dealing with chemicals.

12. Ecological information

Ecotoxic effects:

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

Further ecologic data:

No ecological problems are to be expected when the product is handled and used with due care and attention.

13. Disposal considerations

Product:

Chemicals must be disposed of in compliance with the respective national regulations. Under www.retrologistik.de you will find country- and substance-specific information as well as contact partners.

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 109773
Product name: COD Cell Test (Hg-free) Method: photometric 100 - 1500 mg/l 25 Tests
Spectroquant®
Blindwertküvette

Packaging:

Merck product packaging must be disposed of in compliance with the country-specific regulations or must be passed to a packaging return system. Under www.retrologistik.de you will find special information on the respective national conditions as well as contact partners.

14. Transport information

Road & Rail ADR, RID
UN 3316 CHEMIE-TESTSATZ, 9, II
Inland waterway ADN, ADNR not tested
Sea IMDG-Code
UN 3316 CHEMICAL KIT, 9, II
Ems F-A S-P
Air CAO, PAX
CHEMICAL KIT, 9, UN 3316, II

The transport regulations are cited according to international regulations and in the form applicable in Germany. Possible national deviations in other countries are not considered.
THESE TRANSPORT DATA APPLY TO THE ENTIRE PACK !

15. Regulatory information

Labelling according to EC Directives

Symbol: ---
R-phrases: ---
S-phrases: ---

German regulations

Water pollution class nwg (nonpolluting substance) VwVwS Anh. 4
Storage class VCI 10-13

16. Other information

Reason for alteration

General update.

Contact for information:

HSSE-C/CI * Tel: +49 (0)6151/722775 * Fax: +49 (0)6151/726433 * e-mail: prodsafe@merck.de

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.