

Safety Data Sheet

According to EC Directive 91/155/EEC

Date of issue: 03.06.2005
Supersedes edition of 20.04.2004

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

Identification of the product

Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/l Au 80 Tests
Spectroquant®
Au-1A

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.

Hazardous ingredients:

Name according to EC Directives:

CAS-No.	EC No.	EC-Index-No.	Classification	Content:
Hydrogen peroxide 7722-84-1	231-765-0	008-003-00-9	R5 O; R8 Xn; R20/22 C; R35	≥ 8 - < 25 %

(Full text of R-Phrases in heading 16)

3. Hazards identification

Harmful if swallowed. Risk of serious damage to eyes.

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. Immediately call in ophthalmologist.
After swallowing: immediately make victim drink plenty of water. Call in physician.

Merck Safety Data Sheet

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Au-1A

5. Fire-fighting measures

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

Special risks:
Non-combustible. Has a fire-promoting effect due to release of oxygen.

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:
Prevent fire-fighting water from entering surface water or groundwater.

6. Accidental release measures

Person-related precautionary measures:
Avoid substance contact. Do not inhale vapours/aerosols. 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 material (e.g. Chemizorb®). Forward for disposal. Clean up affected area.

7. Handling and storage

Handling:

No further requirements.

Storage:

Tightly closed in a well-ventilated place, away from sources of ignition and heat. Cool (+2°C to +8°C).

Protected from light.

The data apply to the entire pack.

8. Exposure controls/personal protection

Specific control parameter

TRGS 900

Name	Hydrogen peroxide
Value	1 ml/m ³ 1.4 mg/m ³
Peak limit	=1= Concentration must not exceed limit concentration.

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Au-1A

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: natural latex
Layer thickness: 0.6 mm
Breakthrough time: > 480 Min.

In splash contact:

Glove material: natural latex
Layer thickness: 0.6 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 706 Lapren® (full contact), 706 Lapren® (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:

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

9. Physical and chemical properties

Form:	liquid
Colour:	colourless
Odour:	odourless
pH value	not available
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	(20 °C) ~ 1.05 g/cm ³
Solubility in water	(20 °C) soluble

Merck Safety Data Sheet

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Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/1 Au 80 Tests Spectroquant®
Au-1A

10. Stability and reactivity

Conditions to be avoided

Heating.

Substances to be avoided

Risk of explosion with: / Risk of ignition or formation of inflammable gases or vapors with: alkali metals, alkali salts, alkali hydroxides, alkaline earth metals, metals, metals in powder form, metallic oxides, metallic salts, nonmetals, nonmetallic oxides, aldehydes, alcohols, amines, ammonia, hydrazine and derivatives, hydrides, combustible substances, ethers, acids, anhydrides, oxidizing agent, organic substances, peroxi compounds, impurities/dust, permanganates, organic solvents, organic nitro compounds, brass.

Hazardous decomposition products

no information available

Further information

light-sensitive, heat-sensitive.

11. Toxicological information

Acute toxicity

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

Further toxicological information

Applicable to the toxicologically determinant component:

After inhalation: Irritations of the mucous membranes, coughing, and dyspnoea.

After skin contact: Slight irritations.

After eye contact: conjunctivitis. Risk of serious damage to eyes.

After swallowing: irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract.

Further data

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

12. Ecological information

Applicable to the ecotoxic determinant component:

Biologic degradation:
Readily biodegradable.

Decomposition products: water and oxygen.

Ecotoxic effects:

Biological effects:

In high concentrations: Toxic effect on fish and plankton. When used properly, no impairments in the function of waste- water-treatment plants are to be expected.

Further ecologic data:

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

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 114821
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Au-1A

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.

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

UN 3316 CHEMICAL KIT, 9, 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:	Xn	Harmful
R-phrases:	22-41	Harmful if swallowed. Risk of serious damage to eyes.
S-phrases:	26-39	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear eye/face protection.
contains:	Hydrogen peroxide	

German regulations

Water pollution class 1 (slightly polluting substance) VwVwS Anh. 4

Storage class VCI 10-13

Data sheet of the Chemical Professional Association M009 Hydrogen peroxide

M050 Dealing with harmful substances

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.

Merck Safety Data Sheet

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16. Other information

Text of any R phrases referred to under heading 2:

5 Heating may cause an explosion.
8 Contact with combustible material may cause fire.
20/22 Harmful by inhalation and if swallowed.
35 Causes severe burns.

Reduced labelling on the container due to small quantity.

Reason for alteration

Chapter 2: change in ingredients data.
Chapter 15: labelling.
Chapter 4: first aid measures.
Chapter 11: toxicological information.
Chapter 12: ecological information.

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

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Spectroquant®
Au-2A

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.

Hazardous ingredients:

Name according to EC Directives:

CAS-No.	EC No.	EC-Index-No.	Classification	Content:
Sulphuric acid 7664-93-9	231-639-5	016-020-00-8	C; R35	40 %

(Full text of R-Phrases in heading 16)

3. Hazards identification

Causes severe burns.

4. First aid measures

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.

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According to EC Directive 91/155/EEC

Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/l Au 80 Tests Spectroquant®
Au-2A

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:
Contain escaping vapours with water. Prevent fire-fighting water from entering surface water or groundwater.

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. Chemizorb® H⁺, Art. No. 101595). Forward for disposal. Clean up affected area.

7. Handling and storage

Handling:

No further requirements.

Storage:

Tightly closed in a well-ventilated place, away from sources of ignition and heat. Cool (+2°C to +8°C).

The data apply to the entire pack.

8. Exposure controls/personal protection

Specific control parameter

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 114821
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TRGS 900

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. Filter E (acc. to DIN 3181) for SO₂, HCl.

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). 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.

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Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/l Au 80 Tests Spectroquant®
Au-2A

9. Physical and chemical properties

Form:	liquid	
Colour:	colourless	
Odour:	odourless	
pH value	(20 °C)	strongly acid
Melting point		-68 °C
Boiling point		~ 119 °C
Ignition temperature		not available
Flash point		not available
Explosion limits	lower	not available
	upper	not available
Density	(20 °C)	1.30 g/cm ³
Solubility in water	(20 °C)	soluble (caution ! development of heat)

10. Stability and reactivity

Conditions to be avoided

Strong heating.

Substances to be avoided

A risk of explosion and/or of toxic gas formation exists with the following substances: /
Violent reactions possible with: water, alkali metals, alkali compounds, ammonia, alkaline earth metals, alkalis, acids, alkaline earth compounds, metals, metal alloys, phosphorus oxides, phosphorus, hydrides, halogen-halogen compounds, oxyhalogenic compounds, permanganates, nitrates, carbides, combustible substances, organic solvents, acetylidene, nitriles, nitrides, organic nitro compounds, anilines, peroxides, picrates, lithium silicide.

Hazardous decomposition products

in the event of fire: See chapter 5.

Further information

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

11. Toxicological information

Acute toxicity

LC₅₀ (inhalation, rat): 510 mg/m³ /2 h (calculated on the pure substance) (RTECS).

LD₅₀ (oral, rat): 2140 mg/kg (Using 25 % solution) (RTECS).

Toxicologic values are not available due to other dangerous properties of the substance.

Subacute to chronic toxicity

Applicable to partial component(s):

No teratogenic effect in animal experiments. (IUCLID)

Bacterial mutagenicity: Salmonella typhimurium: negative. (IUCLID)

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Au-2A

Further toxicological information

Property that must be anticipated on the basis from the components of the preparation:

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.

Further data

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

12. Ecological information

Biologic degradation:

Methods for the determination of biodegradability are not applicable to inorganic substances.

Behavior in environmental compartments:

Concentration in organisms is not to be expected.

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).

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.

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.

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Au-2A

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
UN 3316 CHEMICAL KIT, 9, 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:	C	Corrosive
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).

contains: Sulphuric acid

German regulations

Water pollution class 1 (slightly polluting substance) VwVwS Anh. 4

Storage class VCI 8 B

Data sheet of the Chemical Professional Association M004 Irritant substances/corrosive substances

M051 Dangerous chemical substances

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

16. Other information

Text of any R phrases referred to under heading 2:

35 Causes severe burns.

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

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Au-2A

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03.06.2005
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1. Identification of the substance/preparation and of the company/undertaking

Identification of the product

Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/l Au 80 Tests
Spectroquant®
Au-3A

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 inorganic 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: immediately 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. Ambient fire may liberate hazardous vapours.

Special protective equipment for fire fighting:
Do not stay in dangerous zone without self-contained breathing apparatus.

Other information:
Prevent fire-fighting water from entering surface water or groundwater.

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/1 Au 80 Tests Spectroquant®
Au-3A

6. Accidental release measures

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

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

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

7. Handling and storage

Handling:

No further requirements.

Storage:

Tightly closed in a well-ventilated place, away from sources of ignition and heat. Cool (+2°C to +8°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: not required

Industrial hygiene:

Change contaminated clothing. Wash hands after working with substance.

9. Physical and chemical properties

Form: liquid
Colour: colourless
Odour: odourless

pH value		not available
Melting point		not available
Boiling point		not available
Ignition temperature		not available
Flash point		not available
Explosion limits	lower	not available
	upper	not available

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Density not available
Solubility in water (20 °C) soluble

10. Stability and reactivity

Conditions to be avoided

Heating.

Substances to be avoided

Violent reactions possible with: alkali metals, halogen-halogen compounds, strong acids.

Hazardous decomposition products

no information available

Further information

none

11. Toxicological information

Acute toxicity

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

Further toxicological information

Property that must be anticipated on the basis of the components of the preparation:

After inhalation of vapours/aerosols: Slight irritations.

After eye contact: Slight irritations.

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.

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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
UN 3316 CHEMICAL KIT, 9, 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 1 (slightly polluting 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

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Spectroquant®
Au-4A

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

CAS-No.:	108-20-3	EC-Index-No.:	603-045-00-X
M:	102.18 g/mol	EC-No.:	203-560-6
Formula Hill:	C ₆ H ₁₄ O		
Chemical formula:	[(CH ₃) ₂ CH] ₂ O		

3. Hazards identification

Highly flammable. May form explosive peroxides. Repeated exposure may cause skin dryness or cracking.
Vapours may cause drowsiness and dizziness.

4. First aid measures

After inhalation: fresh air.
If breathing stops: mouth-to-mouth respiration or mechanical ventilation. Oxygen mask if necessary! Immediately call in physician.
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. Call in ophthalmologist if necessary.
After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Immediately call in physician.

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Product name: Gold Test Method: photometric 0.5 - 12.0 mg/l Au 80 Tests Spectroquant®
Au-4A

5. Fire-fighting measures

Suitable extinguishing media:
Powder, foam.

Special risks:
Combustible. Vapours heavier than air.
Forms explosive mixtures with air at ambient temperatures. Beware of backfiring.
Development of hazardous combustion gases or vapours possible in the event of fire.

Special protective equipment for fire fighting:
Do not stay in dangerous zone without self-contained breathing apparatus.

Other information:
Cool container with spray water from a safe distance. Prevent fire-fighting water from entering surface water or groundwater.

6. Accidental release measures

Person-related precautionary measures:
Avoid substance contact. Do not inhale vapours/aerosols. Ensure supply of fresh air in enclosed rooms.

Environmental-protection measures:
Do not allow to enter sewerage system; risk of explosion!

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

7. Handling and storage

Handling:

Notes for prevention of fire and explosion:
Keep away from sources of ignition. Take measures to prevent electrostatic charging.

Notes for safe handling:
Work under hood. Do not inhale substance. Avoid generation of vapours/aerosols.

Storage:

Tightly closed in a well-ventilated place, away from sources of ignition and heat. Cool (+2°C to +8°C).

Protected from light.

The data apply to the entire pack.

8. Exposure controls/personal protection

Specific control parameter

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/l Au 80 Tests Spectroquant®
Au-4A

TRGS 900

Name Isopropyl ether
Value 200 ml/m³
850 mg/m³
Peak limit =1= Concentration must not exceed limit concentration.

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. Filter A (acc. to DIN 3181) for vapours of organic compounds

Eye protection: required

Hand protection: In full contact:
Glove material: butyl rubber
Layer thickness: 0.7 mm
Breakthrough time: > 480 Min.
In splash contact:
Glove material: nitrile rubber
Layer thickness: 0.40 mm
Breakthrough time: > 240 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 898 Butoject® (full contact), 730 Camatril® -Velours (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).

Industrial hygiene:

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance. Work under hood . Do not inhale substance.

9. Physical and chemical properties

Form: liquid
Colour: colourless
Odour: ether-like
pH value (20 °C) neutral
Viscosity dynamic (20 °C) 0.3 mPa*s
Melting point -86 °C
Boiling point (1013 hPa) 67-70 °C
Ignition temperature 405 °C (DIN 51794)
Flash point -28 °C (DIN 51755)

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/l Au 80 Tests Spectroquant®
Au-4A

Explosion limits	lower	1.0	Vol%
	upper	21	Vol%
Vapour pressure	(20 °C)	175	hPa
Relative vapour density		3.5	
Density	(20 °C)	0.72	g/cm ³
Solubility in water	(20 °C)	12	g/l
log Pow	(20 °C)	1.52	(experimental)
Refractive index	(20 °C , 589 nm)	1.3689	

10. Stability and reactivity

Conditions to be avoided

Warming.

Substances to be avoided

aldehydes, amines, mineral acids, oxidizing agent (risk of explosion!), zinc.

Hazardous decomposition products

peroxides, Ethylidene peroxides

Stabilizer

2,6-di-tert.-butyl-4-methylphenol (BHT)

Further information

highly inflammable, light-sensitive, sensitive to air; solvent;
incompatible with various plastics.

explosible with air in a vaporous/gaseous state

11. Toxicological information

Acute toxicity

LC₅₀ (inhalation, rat): 162 mg/l (RTECS).

LD₅₀ (dermal, rabbit): >20000 mg/kg (Lit.).

LD₅₀ (oral, rat): 8470 mg/kg (OECD 401).

Further toxicological information

After inhalation: Irritations of the mucous membranes, coughing, and dyspnoea.

After skin contact: Slight irritations. Drying-out effect resulting in rough and chapped skin.

After eye contact: Slight irritations.

After swallowing: irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract. Nausea, vomiting.

After accidental swallowing the substance may pose a risk of aspiration. Passage into the lung (vomiting!) can result in a condition resembling pneumonia (chemical pneumonitis).

After absorption of large quantities: dizziness, headache, narcosis, agitation, spasms, drowsiness, death.

Further data

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

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/l Au 80 Tests Spectroquant®
Au-4A

12. Ecological information

Abiotic degradation:
Rapid degradation. (air).

Biologic degradation:
Biodegradation: 7 % /5 d (IUCLID).
Slightly biodegradable.

Behavior in environmental compartments:
Substance floats on the water surface.

Distribution: log Pow: 1.52 (20 °C) (experimental).
No appreciable bioaccumulation potential is to be expected (log Pow 1-3).

Ecotoxic effects:
Biological effects:
Fish toxicity: *P.promelas* LC₅₀: 92 mg/l /96 h (Lit.); *C.auratus* LC₅₀: 380 mg/l /24 h (Lit.).
Daphnia toxicity: *Daphnia magna* EC₅₀: 190 mg/l /48 h (OECD 202).
Algal toxicity: *Selenastrum capricornutum* IC₅₀: >100 mg/l /96 h (External MSDS).
Bacterial toxicity: *Photobacterium phosphoreum* EC₅₀: 500 mg/l /5 min microtox test (Lit.).

Further ecologic data:
TOD: 2.833 g/g (Lit.).

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.

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

UN 3316 CHEMICAL KIT, 9, 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 !

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/l Au 80 Tests Spectroquant®
Au-4A

15. Regulatory information

Labelling according to EC Directives

Symbol:	F	Highly flammable
R-phrases:	11-19-66-67	Highly flammable. May form explosive peroxides. Repeated exposure may cause skin dryness or cracking. Vapours may cause drowsiness and dizziness.
S-phrases:	9-16-29-33	Keep container in a well-ventilated place. Keep away from sources of ignition - No smoking. Do not empty into drains. Take precautionary measures against static discharges.
EC-No.:	203-560-6	EC label

German regulations

Water pollution class	1	(slightly polluting substance)	VwVwS Anh. 2 KennNr. 598
Storage class VCI	3	A	
Data sheet of the Chemical Professional Association	M017	Solvents	
	M050	Dealing with harmful substances	
Local regulations on chemical accidents:	7b		

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

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.

Safety Data Sheet

According to EC Directive 91/155/EEC

Date of issue:
Supersedes edition of

03.06.2005
20.04.2004

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

Identification of the product

Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/l Au 80 Tests
Spectroquant®
Au-5A

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

Dye solution in organic solvent.

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. Subsequently administer: activated charcoal (20 - 40 g in 10% slurry). Laxative: Sodium sulfate (1 tablespoon/1/4 l water). Call in physician.

5. Fire-fighting measures

Suitable extinguishing media:
Water, CO₂, foam, powder.

Special risks:
Combustible. Vapours heavier than air.
Development of hazardous combustion gases or vapours possible in the event of fire. 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:
Contain escaping vapours with water. Prevent fire-fighting water from entering surface water or groundwater.

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/1 Au 80 Tests Spectroquant®
Au-5A

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 material (e.g. Chemizorb®). Forward for disposal. Clean up affected area.

7. Handling and storage

Handling:

No further requirements.

Storage:

Tightly closed in a well-ventilated place, away from sources of ignition and heat. Cool (+2°C to +8°C).

The data apply to the entire pack.

8. Exposure controls/personal protection

Specific control parameter

TRGS 900

Name	Dimethyl sulfoxide
Value	160 mg/m ³
Skin resorption	Risk of skin absorption

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. Filter A (acc. to DIN 3181) for vapours of organic compounds

Eye protection: required

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/l Au 80 Tests Spectroquant® Au-5A

Hand protection: In full contact:
Glove material: polychloroprene
Layer thickness: 0.65 mm
Breakthrough time: > 480 Min.

In splash contact:
Glove material: natural latex
Layer thickness: 0.6 mm
Breakthrough time: > 240 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 720 Camapren® (full contact), 706 Lapren® (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. Apply skin-protective barrier cream. Wash hands after working with substance.

9. Physical and chemical properties

Form:	liquid
Colour:	red
Odour:	characteristic odour
pH value	not available
Melting point	not available
Boiling point	not available
Ignition temperature	300-302 °C (Dimethylsulfoxide)
Flash point	~ 95 °C (Dimethylsulfoxide)
Explosion limits	lower 1.8 Vol% (Dimethylsulfoxide)
	upper not available
Vapour pressure	(20 °C) 0.6 hPa (Dimethylsulfoxide)
Density	(20 °C) ~ 1.1 g/cm ³
Solubility in water	(20 °C) soluble
log Pow	-1.35 (Dimethylsulfoxide) (Lit.)

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/l Au 80 Tests Spectroquant®
Au-5A

10. Stability and reactivity

Conditions to be avoided

Strong heating.

Substances to be avoided

alkali metals, hydrides, nitrates, halogen-halogen compounds, perchloric acid, perchlorates, chlorates, nonmetallic oxyhalides, oxyhalogenic compounds, acid halides, nitrogen oxides, sulfur oxides, strong oxidizing agents.

Hazardous decomposition products

in the event of fire: See chapter 5.

Further information

incompatible with various plastics, metals (in the presence of atmospheric oxygen and/or moisture);
Explosible with air in a vaporous/gaseous state when heated.

11. Toxicological information

Acute toxicity

LD₅₀ (dermal, rabbit): 40000 mg/kg (Dimethylsulfoxide) (RTECS).

LD₅₀ (oral, rat): 14500 mg/kg (Dimethylsulfoxide) (RTECS).

Subacute to chronic toxicity

Applicable to the toxicologically determinant component:

No indication of carcinogenic activity. (Dimethylsulfoxide) (IUCLID)

No indication of mutagenic activity. (Dimethylsulfoxide) (IUCLID)

Further toxicological information

Properties to be expected on the basis of the main component of the preparation:

After skin contact: Slight irritations. Danger of skin absorption.

After eye contact: Slight irritations.

Possible symptoms: After uptake: CNS disorders, nausea, tiredness, headache.

Possible damages: Damage of: liver, kidneys.

Further data

Further hazardous properties cannot be excluded.

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

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/l Au 80 Tests Spectroquant®
Au-5A

12. Ecological information

Applicable to the main component:

Abiotic degradation:
Rapid degradation. (air)

Biologic degradation:
Biodegradation: 3.1 % /14 d (Dimethylsulfoxide) (OECD 301 C).
Biologically not readily degradable.

Behavior in environmental compartments:
Distribution: log Pow: -1.35 (Dimethylsulfoxide) (Lit.).
No bioaccumulation is to be expected (log Pow <1).

Ecotoxic effects:
Biological effects:
Fish toxicity: *Onchorhynchus mykiss* LC₅₀: 38500 mg/l /96 h (Dimethylsulfoxide) (ECOTOX Database).
Bacterial toxicity: activated sludge EC₅₀: 10-100 mg/l /30 min (Dimethylsulfoxide) (IUCLID).

Further ecologic data:
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.

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
UN 3316 CHEMICAL KIT, 9, 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 !

Merck Safety Data Sheet

According to EC Directive 91/155/EEC

Catalogue No.: 114821
Product name: Gold Test Method: photometric 0.5 - 12.0 mg/l Au 80 Tests Spectroquant®
Au-5A

15. Regulatory information

Labelling according to EC Directives

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

German regulations

Water pollution class 1 (slightly polluting 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.