

MATERIAL SAFETY DATA SHEET

radiello[®]: calibration solution for H₂S **code 171**

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1. Product and company identification

1.1 Product identification

radiello[®]: calibration solution for H₂S code 171

1.1.1 Use

Product for creating the calibration curve for quantifying hydrogen sulfide.

1.1.2 Trade name

Calibration solution for H₂S code 171

1.2 Company identification

1.2.1 Name of supplier Address

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Centro di Ricerche Ambientali/Padova
Via Svizzera 16, 35127 Padova
E-mail: fsmpt@fsm.it
Tel. 0498 064 511 - Fax 0498 064 555

Telephone number

1.3 Emergency contact number

National Toxicology Center

Tel. 0382 24444

2. Composition. Information on ingredients

The product is a concentrated solution of methylene blue which, diluted 1:50 with distilled water, is used to produce the calibration curve.

<i>Ingredients</i>	<i>%</i>	<i>Symbol</i>	<i>R phrases</i>
DISTILLED WATER	99	not required	not required
METHYLENE BLUE (CAS 61-73-4 CE200-515-2)	< 1	Xn	R41; R22

3. Health hazard identification

The product is not classified as dangerous according to directive 1999/45 and Law N. 65 of 14/03/03 (Hazardous Products), since the concentration of METHYLENE BLUE is less than 1% and does not therefore necessitate the risk phrases R22 – R41 “harmful if ingested” and “risk of serious eye lesions”.

4. First aid measures

- 4.1 General indications** In the case of doubt or in the presence of symptoms consult a doctor, taking a copy of this material safety data sheet.
Do not administer any substances by mouth to an unconscious person.
- 4.2 First aid procedures in the case of:**
- 4.2.1 Inhalation** Inhalation of the product is not foreseen in normal conditions of its use. However, should inhalation occur, it is not expected that there would be effects deriving from inhalation of airborne substances that could be released from the product. In the case of respiratory symptoms (cough, dyspnea) move the person to fresh air, place in a semi-seated position, and provide artificial respiration if the person is not breathing.
- 4.2.2 Contact with the skin** Wash the skin with soap and flush with running water for several minutes. Consult a doctor if there are symptoms of irritation (reddening, pain).
- 4.2.3 Contact with the eyes** Flush the eyes, kept open, with large amounts of running water for at least 15 minutes. Consult a doctor if symptoms of irritation (reddening, pain) develop.
- 4.2.4 Ingestion** Do not administer anything to drink. Only rinse the mouth and consult a doctor.

5. Fire fighting measures

The product is a concentrated solution of methylene blue at a concentration of less than 1%.
In the case of a fire in a closed environment (e.g. in a warehouse in which the product is stored) follow the rules below:

- 5.1 General indications** Move all people away and upwind of the fire. Do not enter closed rooms without adequate protection, as specified in point 5.5.
- 5.2 Extinguishing media** Water spray, carbon dioxide, foams, appropriate dry chemical powders.
- 5.3 Extinguishing media that must not be used** Not known.
- 5.4 Exposure risks in the case of fire** Toxic fumes may develop in the case of fire. Refer to point 11.2 for symptoms.
- 5.5 Fire fighting equipment** Use personal protective devices suitable for fighting the fire.

6. Accidental release measures

- 6.1 Personal precautions** It is advisable to protect the skin when handling the product. Avoid contact with the skin and eyes.
- 6.2 Environmental precautions** Given the amount of the product and its packaging, accidental damage to the environment is not possible. Do not dispose of the product (or part of it) in the environment.
- 6.3 Cleaning-up methods**
- 6.3.1 Decontamination** In the case of spills, minimize dust formation. Sweep up the product completely and send it for correct disposal. Wash away the last traces with abundant water.
- 6.3.2 Elimination** Eliminate the contaminated aqueous solution in conformity with existing regulations.

7. Handling and storage

7.1 Handling

- 7.1.1 Technical measures** There are no specific technical requirements for handling the product.
- 7.1.2 Precautionary measures** Avoid contact with the eyes, skin and clothes. Avoid prolonged and repeated exposures.

7.2 Storage

- 7.2.1 Technical measures** Take the necessary measures to avoid accidental spills of the product in the case of breakage of the containers.
- 7.2.2 Storage conditions** Store in original containers or other appropriately labeled, suitable containers. Store in a cool, dry environment away from sources of heat.

8. Exposure control. Personal protection

- 8.1 General hygiene measures** Respect existing safety regulations and use according to the recommendations of the supplier, as indicated in point 7.1. Ensure good ventilation. Wash hands after handling the

product.

8.2 Limits of occupational exposure	Limits of occupational exposure to the components of the product have not been established.
8.3 Personal protection measures	
8.3.1 Respiratory protection	Not necessary during normal use of the product.
8.3.2 Eye protection	Wear protective glasses to prevent splashes of solution entering the eyes.
8.3.3 Hand protection	Wear appropriate protective gloves
8.3.4 Skin protection	Wear work clothes or suitable protective clothing.

9. Physical and chemical properties

9.1 Physical state	Liquid.
9.2 Color	Blue.
9.3 Odor	Not perceptible.
9.4 pH	Not applicable.
9.5 Boiling point	100°C.
9.6 Melting point	Not applicable.
9.7 Flash point	Not inflammable.
9.8 Flammability	Not inflammable.
9.9 Auto-ignition	Not inflammable.
9.10 Explosive properties	Not applicable.
9.11 Combustion properties	Not applicable.
9.12 Vapor pressure	Not applicable.
9.13 Vapor density	Not applicable.
9.14 Solubility in water	Soluble.
9.15 Solubility in organic solvents	Not applicable.
9.16 Partition coefficient	Not applicable.
9.17 Density	1 g/cm ³ .
9.18 Miscibility	Not applicable.
9.19 Evaporation rate	Not applicable.
9.20 Conductivity	Not applicable.
9.21 Viscosity	Not applicable.

10. Stability and reactivity

- | | |
|--|---|
| 10.1 Conditions to avoid | Stable product, avoid sources of heat. |
| 10.2 Materials to avoid | Bases and strongly reducing agents. |
| 10.3 Hazardous decomposition products | The product is stable. The thermal decomposition products in the case of fire are carbon monoxide, nitrogen oxide, sulphur oxide and gaseous hydrochloric acid. |

11. Toxicological information

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|----------------------------|---|
| 11.1 Toxicity data | <p>METHYLENE BLUE is the only component of the produce for which the oral LD₅₀ has been determined in rats. The value is 1180 mg/Kg.</p> <p>Other LD₅₀ values in the rat are:
 intrapertoneal 180 mg/Kg
 subcutaneous 190 mg/Kg
 intravenous 77 mg/Kg</p> <p>The LD₅₀ values in the mouse are:
 oral 3500 mg/Kg
 intrapertoneal 150 mg/Kg
 intravenous 77 mg/Kg</p> <p>The intravenous LD₅₀ value for domestic animals is 42300 microg/Kg</p> |
| 11.2 Acute toxicity | <p>Systemic absorption of METHYLENE BLUE induces the formation of methaemoglobin which, at sufficient levels, causes cyanosis. This effect can occur from 2-4 hours or more after exposure. The signs of exposure are nausea, confusion, headache, abdominal pain, vomiting and diarrhea.</p> |
| 11.2.1 Inhalation | The product can be noxious if inhaled. |
| 11.2.2 Skin contact | Contact between the skin and methylene blue can cause slight irritation of the skin |
| 11.2.3 Eye contact | If METHYLENE BLUE comes into contact with the eyes it can cause reddening, burning, pain, tears and photophobia. |
| 11.2.4 Ingestion | The ingestion of METHYLENE BLUE is noxious. |

11.3 Chronic toxicity	
11.3.1 Inhalation	This is not a normal route of exposure during use of the product.
11.3.2 Skin contact	This is not a normal route of exposure during use of the product.
11.3.3 Eye contact	This is not a normal route of exposure during use of the product.
11.3.4 Ingestion	This is not a normal route of exposure during use of the product.
11.4 Delayed effects	See point 11.2.
11.5 Corrosiveness. Irritant potential	
11.5.1 Skin	METHYLENE BLUE can cause irritation to the skin.
11.5.2 Mucosa	METHYLENE BLUE can cause irritation to the mucosa.
11.5.3 Eyes	METHYLENE BLUE can cause severe irritation to the eyes.
11.6 Sensitizing potential	Not known.
11.7 Carcinogenicity	At the current state of knowledge, studies to determine the carcinogenic potential (in humans and in animals) of the product or its components not appear to have been conducted.
11.8 Mutagenicity	METHYLENE BLUE has been documented to have genotoxic and/or mutagenic effects: <ul style="list-style-type: none">- DNA damage (70 micromol/L for rats, 1830 micromol/L for mammals- histidine reversion (Ames) 70 micromol/L.
11.9 Effects on reproduction	At the current state of knowledge, studies conducted to determine the potential effect on reproduction in the rat have shown effects on fertility and post-implantation mortality at oral doses of 2500 mg/Kg.
11.10 Teratogenic effects	At the current state of knowledge, studies to determine the teratogenic potential (in humans and in animals) of the product or its components do not appear to have been conducted.
11.11 Narcotic effect	Not expected.

12. Ecological information

12.1 Mobility	Data not available.
12.2 Persistence and degradability	Data not available.
12.3 Bioaccumulation potential	Data not available.
12.4 Aquatic toxicity	Data not available.
12.5 Remarks	Do not dispose of the product (or part of it) in the environment.

13. Disposal considerations

For disposal purposes, the product (or part of it) is considered as special waste. After use, the material must be disposed of in conformity with the disposal of other laboratory products. Contact a Center authorized to dispose of this type of waste. Do not dispose of the product in the environment.

14. Transport information

14.1 General information	The product is not subject to any international regulations concerning its transport.
14.2 Road and rail transport (ADR/RID)	Not dangerous.
14.3 Sea transport (IMDG/IMO)	Not dangerous.
14.4 Air transport (ICAQ/IATA)	Not dangerous.

15. Regulatory information

15.1 Labeling	Not required.
15.2 Hazard symbols	None.
15.3 Risk phrases	None.
15.4 Safety phrases	None..

16. Other information

<i>Ingredients</i>	<i>Symbol</i>	<i>R phrases</i>
DISTILLED WATER	none	not required
METHYLENE BLUE	Xn	R41: Risk of severe eye lesions. R22: Harmful if ingested. S26: In the case of contact with the eyes, wash the eyes with copious amounts of water and consult a doctor S36: Wear eye and face protection.

Advice to users

The information in this material safety data sheet is based on our current knowledge and on Italian and European Community regulations. The product must not be used for any purposes other than those specified in section 1, in the absence of written instructions on its handling. It is the user's responsibility to take all measures necessary to conform with local and national regulations.

The information in this data sheet complies with Directive CEE 1999/45 (assimilated in Italy by Law No. 65 of 14/03/03) and with Directive CEE 2001/58 (assimilated in Italy by Ministerial Decree 7/9/2002). The set of regulations mentioned is simply intended to help the user comply with his or her obligations during the use of the products.