



## Material Safety Data Sheet

**MSDS/SDS Number:** M118059  
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**Revision:** A

### SECTION 1 PRODUCT AND COMPANY INFORMATION

**Product:** Chemiluminescent Substrate A

**Trade Names and Catalogue Numbers:** 20-212C, 17-376, 20212C, 17376

**Chemical Name:** Chemiluminescent substance in aqueous dimethyl sulfoxide.

**Product use:** For use in the Nitrotyrosine Assays (Kit 17-376)

**Other trade names and synonyms:** 2% Dimethyl Sulfoxide in Water

**Manufacturer/Distributor:** Millipore Corporation (Corporate Headquarters)      Millipore S.A.S. (European Headquarters)

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### SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

Component	EINECS or ELINCS No.	CAS No.	Content (weight percent)	Symbol letters*	R Phrases**
Dimethyl sulfoxide	200-664-3	67-68-5	2%	<b>Xi</b>	<b>R36/37/38</b>

This product also contains a proprietary Chemiluminescent substrate and water that are not dangerous substances or hazardous chemicals as defined in European Community Directives 67/548/EEC or 1999/45/EC, and Hazard Communication Standard (29 CFR 1910.1200).

\* Symbol letters and categories of danger: **T+** = Very toxic, **T** = Toxic, **C** = Corrosive, **Xn** = Harmful, **Xi** = Irritant, **E** = Explosive, **F+** = Extremely flammable, **F** = Very flammable, **N** = Dangerous for the environment, **O** = Oxidising.

\*\* The full text of each phrase is listed in Section 16.

### SECTION 3 HAZARD IDENTIFICATION / EMERGENCY OVERVIEW

**Appearance:** Colorless liquid

**Classification:** This product is not classified according to Directive 1999/45/EC.

#### Adverse human health effects

**Contact with Eyes:** Possible mild eye irritant. Effects include burning sensation, redness, tearing, inflammation, and possible corneal injury. May cause chemical conjunctivitis.

**Ingestion:** Possible mild gastrointestinal tract irritant. Effects may include nausea, vomiting and diarrhea. May cause liver and kidney damage. May cause garlic smell on the breath and body.

**Inhalation (Short Term):** Possible mild respiratory tract irritant.

**Inhalation (Long Term):** Possible delayed pulmonary edema.

**Skin Contact:** Possible mild skin irritant. Effects may include burning pain, itching and redness. Dimethyl sulfoxide is rapidly absorbed through the skin.

**Target Organs:** Kidneys, liver, eyes, skin, mucous membranes..

**Medical conditions aggravated by exposure:** Preexisting skin conditions.

**Adverse environmental effects:** Available experimental data indicates dimethyl sulfoxide exhibits a low level of toxicity in the aquatic environment. See section 12. .

**Adverse physiochemical effects:** None expected.

### SECTION 4 FIRST AID MEASURES

**Contact with Eyes:** In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Seek immediate medical attention.

**Ingestion:** If swallowed, summon medical assistance, and then wash out mouth with water provided person is conscious. Do not induce vomiting unless directed to do so by a health care provider.

**Inhalation:** If inhaled, remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek immediate medical attention.

**Skin Contact:** In case of contact, immediately wash skin with soap and copious amounts of water. Seek medical attention if irritation or redness occurs. Launder clothing before reuse.

## SECTION 5 FIRE FIGHTING MEASURES

<b>Flash Ignition Temperature:</b>	>200°C, not considered to be a fire hazard.	
	Data for 100% dimethyl sulfoxide	
<b>Autoignition Temperature (ASTM D1929):</b>	215 °C	
<b>Flammability Limits:</b>	Lower limit: 2.6%	Upper limit: 42%
<b>Suitable extinguishing media:</b>	Media suitable for the surrounding fire..	
<b>Unsuitable extinguishing media:</b>	None known.	
<b>Special protective equipment for firefighters:</b>	None required	
<b>Special exposure hazards:</b>	None	

## SECTION 6 ACCIDENTAL RELEASE MEASURES

### Personal precautions:

**Small spills:** Area evacuation is not required. Eliminate unnecessary traffic in area of the spill. Wear chemically resistant boots, clothing and gloves (nitrile, neoprene) to prevent skin contact. Eliminate sources of combustion. Clean up spills immediately. Avoid clean up techniques that will create and disperse aerosols. Wear appropriate protective clothing and if necessary, breathing apparatus. Collect residues and place in labeled plastic containers. Avoid breathing vapors and aerosols and avoid contact with skin and eyes.

**Large spills:** In addition to Small Spill precautions, evacuate area of all personnel not involved in the clean-up operation and move upwind, if aerosol formation is possible.

**Environmental precautions:** May be discharged into sewer, or industrial waste water systems if allowed by local regulations. Otherwise, collect and dispose according to federal, state and local regulations.

**Clean up measures:** Small spills may be immobilized with the aid of sand or granules and stored in closed containers pending final disposition. Larger spill may be absorbed in sand, sawdust or vermiculite, and stored in closed containers pending final disposition (See section 13). Wash spill area with detergent and water to remove residual contamination. This water may be disposed to the sanitary sewer.

## SECTION 7 HANDLING AND STORAGE

**Handling:** Avoid contact with eyes and skin. Wear gloves. Do not inhale aerosols or vapors. May be harmful if swallowed. Use personal protective equipment outlined in section 8. Wash thoroughly after handling. Use with adequate ventilation.

**Storage:** Store frozen at -20°C, unless directed otherwise by the product data sheet. Avoid repeated freeze/thaw cycles.

## SECTION 8 EXPOSURE CONTROL AND PERSONAL PROTECTION

	Normal Handling Conditions	Emergency Response Conditions
<b>Respiratory protection:</b>	Not normally required for normal use.	If aerosols are present - air purifying respirator with organic cartridges.
<b>Ventilation:</b>	General room ventilation	If aerosols are present, provide exhaust ventilation
<b>Eye protection:</b>	Safety glasses with side shields	Chemical splash goggles.
<b>Skin protection:</b>	Nitrile gloves and laboratory coat.	Chemically resistant jacket, pants, gloves, boots and head covering

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Colorless liquid
<b>Odor:</b>	Odorless to very slight garlic- like.
<b>Odor Threshold:</b>	No data have been found
<b>pH:</b>	6-8.
<b>Melting Point:</b>	-1 to -3°C
<b>Boiling Point:</b>	100-102°C
<b>Flash Ignition Point:</b>	>200°C (closed cup)
<b>Explosive Properties:</b>	Not considered to have explosive properties.
<b>Oxidizing Properties:</b>	Not considered to have oxidizing properties.
<b>Vapor pressure, 20 °C:</b>	<0.2 mm Hg
<b>Specific Gravity (Water = 1.0):</b>	1.0 – 1.1
<b>Solubility</b>	Miscible with water
<b>Vapor Density, 20 °C:</b>	2.7 (100% dimethyl sulfoxide)
<b>Viscosity, centipoise:</b>	Not available
<b>Partition coefficient (n-octanol/water):</b>	0.045 (dimethyl sulfoxide)

## SECTION 10 STABILITY AND REACTIVITY

<b>Chemical Stability:</b>	Stable under normal temperatures and pressures.
<b>Conditions to Avoid:</b>	Elevated temperature.
<b>Incompatible With:</b>	Strong oxidizing agents, strong bases, strong acids.
<b>Hazardous Decomposition Products:</b>	Carbon monoxide and dioxide, oxides of sulfur, formaldehyde, dimethyl disulfide, dimethyl sulfide and, methyl mercaptan.
<b>Hazardous Polymerization:</b>	Will not occur.

## SECTION 11 TOXICOLOGICAL INFORMATION

- Eye Contact:** May Cause eye irritation accompanied by a burning sensation, redness, tearing, inflammation, and possible corneal injury. May cause chemical conjunctivitis.
- Ingestion:** May cause gastrointestinal tract irritation. Symptoms may include nausea, vomiting and diarrhea. May cause liver and kidney damage. May cause garlic smell on the breath and body.
- Inhalation:** May cause respiratory tract and delayed pulmonary edema.
- Skin Contact:** May cause skin irritation accompanied by burning pain, itching and redness. Dimethyl sulfoxide is rapidly absorbed through the skin.
- Carcinogenicity:** Dimethyl sulfoxide is not listed as carcinogenic by ACGIH, IARC, NTP, OSHA or California proposition 65.
- Chronic Toxicity:** Repeated or prolonged exposure to dimethyl sulfoxide may cause dermatitis, liver and kidney damage. These effects may be delayed.
- Toxicology Data:**
- | Dimethyl sulfoxide (100%)             | RTECS # <b>PV6210000</b> |
|---------------------------------------|--------------------------|
| LD <sub>50</sub> , oral, rat          | 14,500 mg/kg             |
| LD <sub>50</sub> , oral, mouse        | 7,920 mg/kg              |
| LD <sub>50</sub> , skin, rat          | 40,000 mg/kg             |
| Draize test, rabbit, eye, 100 mg      | Mild                     |
| Draize test, rabbit, eye: 500 mg/24H  | Mild                     |
| Draize test, rabbit, skin: 500 mg/24H | Mild                     |
- Dimethyl sulfoxide has been investigated as a tumorigen, mutagen, reproductive effector, and primary human irritant.

## SECTION 12 ECOLOGICAL INFORMATION

- Ecotoxicity:** For 100% dimethyl sulfoxide
- Toxicity to fish
- |  |             |
|--|-------------|
| LC <sub>50</sub> , Pimephales promelas (fathead minnow), 96H | 34,000 mg/l |
| LC <sub>50</sub> , Oncorhynchus mykiss (rainbow trout), 96H  | 35,000 mg/l |
- Toxicity to daphnia and other aquatic invertebrates.
- |   |             |
|---|-------------|
| EC <sub>50</sub> , Daphnia pulex (Water flea) - | 27,500 mg/l |
|---|-------------|
- Toxicity to algae
- |   |                |
|---|----------------|
| EC <sub>50</sub> , Lepomis macrochirus (Bluegill), 96 H | > 400,000 mg/l |
|---|----------------|
- Environmental Fate:** Dimethyl sulfoxide disproportionates in water to dimethyl sulfide and dimethyl sulfone, a reaction catalyzed by light. Dimethyl sulfoxide is difficult to biodegrade. DMSO exhibits essentially no biochemical oxygen demand (BOD) because the molecule itself provides oxygen.

## SECTION 13 DISPOSAL INFORMATION

Products containing dimethyl sulfoxide may be disposed to an industrial sewer system only with permission from the local authority having jurisdiction. Waste product must be disposed in a manner consistent with national, state, and local regulations.

**European Community:** When disposal is required, this product be considered according to the European Waste catalogue (European commission decision of 03/05/01 modifying directives 94/3/CE and 75/442/CE) as part of the following category:

**16 10 01\* aqueous liquid wastes containing dangerous substances**

**United States:** This product does not meet the definition of a US Environmental Protection Agency RCRA hazardous waste. Unused product should be disposed of in a manner consistent with federal, state and local regulations.

## SECTION 14 TRANSPORTATION INFORMATION

The transportation of this product is not regulated by IMDG (sea), ADR (road), RID (rail), ICAO/IATA (air), or USDOT as a dangerous goods or hazardous material.

## SECTION 15 REGULATORY INFORMATION

<b>Australia:</b>	Hazchem Code:	None Allocated
	Poisons Schedule Number:	S6
<b>California:</b>	No Significant Risk Level:	Not listed
<b>Canada:</b>	WHMIS:	This product has a WHMIS classification of unclassified.
<b>European Community:</b>	Symbols:	None
	Category of danger:	None
	Risk phrases:	None
	Safety phrases:	<b>S26</b> In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
		<b>S37/39</b> Wear suitable gloves and eye/face protection.
	OECD/High Production Volume (HPV) chemicals:	Dimethyl sulfoxide is listed as a High Volume Production chemical.
	WEEE and RoHS:	The WEEE and RoHS Directives are not applicable to these products.
<b>Japan:</b>	Poisonous and Deleterious Substances Control Law:	Dimethyl sulfoxide is not listed by the Poisonous and Deleterious Substances Control Law

## Section 15 Regulatory information (continued)

<b>United States</b>	Toxic Substances Control Act (TSCA):	The Chemiluminescent substrate is not listed on the EPA Toxic Substances Control Act (TSCA) Inventory. In the United States, this product may be used only in research and development or FDA regulated activities.
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**Occupational Exposure**

<b>Limits</b>	<b>WEEL</b>	<b>OSHA PEL</b>	<b>NIOSH REL</b>	<b>ACGIH TLV</b>
Dimethyl Sulfoxide	250 ppm	None	None	None

**SECTION 16 ADDITIONAL INFORMATION**

Risk phrases referred to under Section 2:

**R36/37/38** Irritating to eyes, respiratory system and skin**Abbreviations Used**

ACGIH	American Conference of Government Industrial Hygienists
ADR	European agreement on the international carriage of dangerous goods on road
CAS	Chemical Abstract Service
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EPA	United States Environmental Protection Agency
IARC	International Agency for Research in Cancer.
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IMDG	Regulations regarding the transportation of dangerous goods on ocean-going vessels issued by the International Maritime Organization.
IUCLID	International Uniform Chemical Information Database
LC <sub>50</sub>	Lethal Concentration 50% is the concentration of a chemical which kills 50% of a sample population
LD <sub>50</sub>	Lethal Dose 50% is the dose of a chemical which kills 50% of a sample population.
LDLo	Lowest observed lethal dose
NIOSH	National Institute of Occupational Safety and Health (US)
NTP	National Toxicology Program (US)
OSHA	United States Occupational Safety and Health Administration
RID	International regulations concerning the international carriage of dangerous goods by rail.
RTECS	Registry of Toxic Effects of Chemical Substances (US)
VLE	15 minute short term exposure limit (France)
WEEL	Workplace Environmental Exposure Levels – American Industrial Hygiene Association
WEL	Workplace Exposure Limit (EU)
WHMIS	Workplace Hazardous Materials Information System (Canada)

This safety data sheet has been prepared to comply with the requirements of European Union Directive 2001/58/EC and ANSI Z400.1-1998.

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