



## Material Safety Data Sheet

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### **SECTION 1 IDENTIFICATION OF THE SUBSTANCE OR PREPARATION AND OF THE COMPANY / UNDERTAKING – CHEMICAL PRODUCT & COMPANY IDENTIFICATION**

**Trade Name:** Tyrosine Protein Phosphatase Inhibitor Cocktail

**Catalogue Number(s):** 20-203  
A component of Protein Phosphatase Inhibitor Set, 17-317

**Chemical Name:** An aqueous solution of sodium orthovanadate, sodium molybdate, imidazole and sodium tartrate.

**Product use:** Biological Research Reagent

**Other trade names and synonyms:** Aqueous solution of sodium orthovanadate, sodium molybdate, imidazole and sodium tartrate.

**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**
				T Repro Cat. 2	R61
Imidazole	206-019-2	288-32-4	1.0 – 1.5%	Xn	R22
				C	R34
Sodium orthovanadate	237-287-9	13721-39-6	1.5 – 2.0%	T	R23/24/25
Sodium molybdate	Unlisted	7631-95-0	2.0 – 2.5%	Xi	R36/37/38
Sodium tartrate	212-773-3	868-18-8	9 – 10%	None	None
Water	231-791-2	7732-18-5	Remainder	None	None

\* 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:** Clear, colorless liquid

**Classification:** This product is classified as Toxic, T, according to Directive 1999/45/EC.

### Adverse human health effects:

**Contact with Eyes:** Eye irritant, that may cause eye burns, chemical conjunctivitis and corneal damage.

**Ingestion:** Gastrointestinal irritant. Ingestion may cause severe and permanent damage to the digestive tract including burns and perforation of the digestive tract.

**Inhalation (Short Term):** Respiratory tract irritant, and may cause upper respiratory system burns.

**Inhalation (Long Term):** Long term or repeated exposure to aerosols containing imidazole aerosols may cause pulmonary edema.

**Skin Contact:** Skin irritant. May be absorbed through the skin in quantities sufficient to be harmful.

**Target Organs:** Imidazole – liver and kidneys, fetal toxin.  
Sodium molybdate - Respiratory system, eyes, skin.  
Other components – none found.

**Medical conditions aggravated by exposure:** No information has been found. Based upon animal experiments, pregnant women and those who may become pregnant should avoid contact with imidazole and products that contain imidazole.

**Adverse environmental effects:** Environmental toxicity and fate data for the components of this product are very limited. Available data do not indicate a significant environmental hazard.

**Adverse physiochemical effects:** None expected.

## SECTION 4 FIRST AID MEASURES

- Contact with Eyes:** In case of contact with eyes, summon medical assistance, and flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers.
- Ingestion:** If swallowed, summon medical assistance, and, if person is conscious, give large amounts of water. Do not induce vomiting unless advised to do so by a medical professional.
- Inhalation:** If inhaled, remove from exposure and summon medical assistance. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
- Skin Contact:** In case of contact, immediately wash skin with soap and copious amounts of water. If irritation or redness occurs, seek medical attention. Launder clothing before reuse; destroy shoes – do not attempt to reuse.

## SECTION 5 FIRE FIGHTING MEASURES

- Flash Ignition Temperature:** Not determined; expected to be greater than 145°C – not consider a fire hazard.
- Autoignition Temperature (ASTM D1929):** Not applicable
- Flammability Limits:** Not applicable
- Suitable extinguishing media:** Employ extinguishing media suitable for the surrounding fire.
- Unsuitable extinguishing media:** None known.
- Special protective equipment for firefighters:** Aerosols containing imidazole may be irritating; if large quantities of this product are involved in a fire, use self-contained breathing apparatus in pressure-demand mode and full protective gear.
- Special exposure hazards:** None expected.

## SECTION 6 ACCIDENTAL RELEASE MEASURES

- Personal precautions:** Clear area of all unnecessary personnel. Wear chemically resistant boots, clothing and gloves (nitrile, neoprene) to prevent skin contact, since this product is irritating and may be absorbed through the skin.
- Small spills:** Clean up spills immediately. Wear appropriate protective clothing and if necessary breathing apparatus. Avoid breathing aerosols and contact with skin and eyes.
- Large spills:** Evacuate the area and restrict access to only those trained in hazardous materials spill response.
- Environmental precautions:** Although this product is expected to be only slightly toxic to aquatic species, prevent it from entering waterways
- Clean up measures:** Contain spill and absorb with sand, earth, or vermiculite. Commercial liquid spill products may be used to adsorb and absorb the spill. Collect residues and place in labeled metal container. 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.  
May be harmful if swallowed and in contact with the skin.  
Use personal protective equipment outlined in section 8.  
Wash thoroughly after handling  
Use with adequate ventilation
- Storage:** Store at room temperature, away from sources of heat, unless directed otherwise by the product data sheet.

## 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>	Clear, colorless liquid.
<b>Odor:</b>	Very faint amine odor.
<b>Odor Threshold:</b>	Not available
<b>pH:</b>	8-10
<b>Melting Point:</b>	-3 to -5°C
<b>Boiling Point:</b>	102-104°C
<b>Flash Ignition Point:</b>	Non-flammable
<b>Explosive Properties:</b>	Not considered to have explosive properties
<b>Oxidizing Properties:</b>	Not considered to have oxidizing properties
<b>Vapor pressure, 70 °C:</b>	<1 mm Hg
<b>Specific Gravity (Water = 1.0):</b>	1.1 – 1.2
<b>Solubility</b>	Completely miscible with water
<b>Vapor Density, 20 °C:</b>	Not applicable
<b>Viscosity, centipoise:</b>	Not available.
<b>Partition coefficient (n-octanol/water):</b>	Not available.

## SECTION 10 STABILITY AND REACTIVITY

<b>Chemical Stability:</b>	Stable under normal temperatures and pressures.
<b>Conditions to Avoid:</b>	incompatible materials, excess heat,
<b>Incompatible With:</b>	Strong oxidizing agents, acids, and alkalis.
<b>Hazardous Decomposition Products:</b>	Carbon and nitrogen oxides, fumes of molybdenum and vanadium oxides.
<b>Hazardous Polymerization:</b>	Will not occur

## SECTION 11 TOXICOLOGICAL INFORMATION

- Inhalation:** Will cause respiratory tract irritation, and may cause upper respiratory system burns.
- Ingestion:** Will cause gastrointestinal irritation. Ingestion may cause severe and permanent damage to the digestive tract including burns and perforation of the digestive tract.
- Skin Contact:** Will cause skin irritation. May be absorbed through the skin in quantities sufficient to be harmful.
- Eye Contact:** Will cause eye irritation, and may cause eye burns, chemical conjunctivitis and corneal damage.
- Carcinogenicity:** Not listed as carcinogenic by ACGIH, IARC, NTP, OSHA or California proposition 65: Imidazole, sodium orthovanadate, sodium tartrate.  
Sodium Molybdate - ACGIH: Group A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Molybdenum soluble compounds'). Sodium Molybdate is not listed as carcinogenic by , IARC, NTP, OSHA or California proposition 65.
- Chronic Toxicity:** Long term exposure to this product may have adverse effects on fetal health based upon animal studies of individual components.
- Toxicology Data:** Toxicological data for this product as an entity are not available. Toxicological data for the components of the product:

Compound: Imidazole (100%)	RTECS#:
LD <sub>50</sub> , oral, rat	220 mg/kg
LD <sub>50</sub> , oral, mouse	880 mg/kg
Imidazole has been studied has been investigated as a reproductive effector and mutagen	
Compound: Trisodium orthovanadate (100%)	RTECS#: YW1120000
LD <sub>50</sub> , oral, rat	330 mg/kg
Trisodium orthovanadate has been investigated as a reproductive effector and mutagen	
Compound: Sodium molybdate	RTECS#: QA5075000
LD <sub>50</sub> , oral, rat	4,000 mg/kg
Sodium Molybdate has been investigated as a reproductive effector and mutagen.	

## SECTION 12 ECOLOGICAL INFORMATION

Ecological information is not available for this product as an entity.  
Ecological information for component compounds

### Imidazole

#### Ecotoxicity:

LC<sub>50</sub> *Leuciscus idus* (fresh water fish) 280 mg/liter, 48 hours, static

LC<sub>50</sub> *Daphnia magna* (crustacea) >500 mg/liter, 24 hours

This product is expected to have a moderately low toxicity to aquatic species and to have a low tendency to bioaccumulate.

**Environmental Fate:** Imidazole is expected to biodegrade at a moderately slow rate in contact with soils and natural waters.

### SECTION 13 DISPOSAL INFORMATION

This product may be disposed to an industrial sewer system, if permitted by local regulation. This product must be disposed in a manner consistent with national, state, and local regulations.

**European Union:** 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:** When used, this product does not meet the definition of a US Environmental Protection Agency RCRA hazardous waste. Used and 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:	None Allocated
<b>California:</b>	No Significant Risk Level:	None of the components of this product are known to Millipore Corporation to be listed.
<b>Canada:</b>	WHMIS:	These products have WHMIS classifications of Not classified.
<b>European Union:</b>	Symbols:	T
	Category of danger:	Toxic; Reproductive toxin Cat. 2
	Risk phrases:	R61 May cause harm to the unborn child.
	Safety phrases:	S24/25 Avoid contact with skin and eyes
		S28 After contact with skin, wash immediately with plenty of soap and water.
		S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
	OECD/High Production Volume (HPV) chemicals:	None of the components of this product are High Volume Production chemicals.
	WEEE and RoHS:	The WEEE and RoHS Directives are not applicable to these products.

## Section 15 – Regulatory Information (continued)

<b>Japan:</b>	Poisonous and Deleterious Substances Control Law:	None of the components of this product are listed by the Poisonous and Deleterious Substances Control Law
<b>United States</b>	Toxic Substances Control Act:	All components of this product are listed on the EPA Toxic Substances Control Act (TSCA) Inventory.

**Occupational Exposure Limits**

<b>Component</b>	<b>Occupational Exposure Limits, ppm</b>	
Imidazole and Sodium orthovanadate	ACGIH TLV, European Union IOELV , Japan OEL, NIOSH REL, United Kingdom WEL, and US OSHA PEL	None established
Sodium Molybdate	ACGIH TLV, TWA, US OSHA PEL	0.5 mg/m <sup>3</sup> TWA (respirable fraction, as Mo) (listed under Molybdenum soluble compounds).
	NIOSH IDLH	1000 mg/m <sup>3</sup> IDLH (as Mo) (listed under Molybdenum soluble compounds).
	European Union IOELV , Japan OEL, and United Kingdom WEL,	None established

## SECTION 16 ADDITIONAL INFORMATION

Risk phrases referred to under Section 2:

R22	Harmful if swallowed
R23/24/25	Toxic by inhalation, in contact with skin and if swallowed
R34	Causes burns
R36/37/38	Irritating to eyes, respiratory system and skin
R61	May cause harm to the unborn child.

### 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.
IOELV	Indicative Occupational Exposure Limit Value (EU)
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
MSFU	Manufacture, Formulation, Supply and Use (Section 13)
NIOSH	National Institute of Occupational Safety and Health (US)
NTP	National Toxicology Program (US)
OSHA	United States Occupational Safety and Health Administration
REL	Recommended Exposure Limit
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)
WEL	Workplace Exposure Limit (UK)
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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