

SAFETY DATA SHEET



P3211 pH combination electrode, Part Number 5190-3988

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name : P3211 pH combination electrode, Part Number 5190-3988
Part no. (chemical kit) : 5190-3988
Part no. : * P3211 electrode P3211
 Reference solution 5190-0545-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Analytical chemistry.
 * P3211 electrode Electrodes.(1 x 7 ml)
 Reference solution 1 x 30 ml
Uses advised against : None known.

1.3 Details of the supplier of the safety data sheet

Agilent Technologies Deutschland GmbH
 Hewlett-Packard-Str. 8
 76337 Waldbronn
 Germany
 0800 603 1000

e-mail address of person responsible for this SDS : pdl-msds_author@agilent.com

1.4 Emergency telephone number

Emergency telephone number (with hours of operation) : CHEMTREC®: +(44)-870-8200418

Note * : * This product is considered an article. This Safety Data Sheet is written based on the encapsulated substance or mixture in this article. This article, when used under reasonable conditions and in accordance with the directions for use, should not present a health hazard. The substance or mixture is encapsulated in the article. Only if released due to use or processing of the article in a manner not in accordance with the product's directions for use it may present potential health and safety hazards.

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : * P3211 electrode Mixture (encapsulated in article)
 Reference solution Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

* P3211 electrode

H360D	REPRODUCTIVE TOXICITY	Category 1B
H400	SHORT-TERM (ACUTE) AQUATIC HAZARD	Category 1
H410	LONG-TERM (CHRONIC) AQUATIC HAZARD	Category 1

Reference solution

H360D	REPRODUCTIVE TOXICITY	Category 1B
H400	SHORT-TERM (ACUTE) AQUATIC HAZARD	Category 1
H410	LONG-TERM (CHRONIC) AQUATIC HAZARD	Category 1

* P3211 electrode	The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.
Reference solution	The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.

SECTION 2: Hazards identification

Ingredients of unknown toxicity : * P3211 electrode
 Reference solution

Percentage of the mixture consisting of ingredient(s) of unknown acute dermal toxicity: 1 - 10%
 Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 10 - 30%
 Percentage of the mixture consisting of ingredient(s) of unknown acute dermal toxicity: 10 - 30%
 Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 10 - 30%

See Section 16 for the full text of the H statements declared above.
 See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms : * P3211 electrode



Reference solution



Signal word : * P3211 electrode
 Reference solution

Danger
 Danger

Hazard statements : * P3211 electrode
 Reference solution

H360D - May damage the unborn child.
 H410 - Very toxic to aquatic life with long lasting effects.
 H360D - May damage the unborn child.
 H410 - Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention : * P3211 electrode

P201 - Obtain special instructions before use.
 P280 - Wear protective gloves, protective clothing and eye or face protection.
 P273 - Avoid release to the environment.
 P201 - Obtain special instructions before use.
 P280 - Wear protective gloves, protective clothing and eye or face protection.
 P273 - Avoid release to the environment.

Reference solution

Response : * P3211 electrode

P391 - Collect spillage.
 P308 + P313 - IF exposed or concerned: Get medical advice or attention.
 P391 - Collect spillage.
 P308 + P313 - IF exposed or concerned: Get medical advice or attention.

Reference solution

Storage : * P3211 electrode
 Reference solution

Not applicable.
 Not applicable.

Disposal : * P3211 electrode

P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
 P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Reference solution

Hazardous ingredients : * P3211 electrode
 Reference solution

silver chloride
 silver chloride

Supplemental label elements : * P3211 electrode
 Reference solution

Not applicable.
 Not applicable.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : * P3211 electrode
 Reference solution

Restricted to professional users.
 Restricted to professional users.

SECTION 2: Hazards identification

Special packaging requirements

Tactile warning of danger : * P3211 electrode Not applicable.
Reference solution Not applicable.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII : * P3211 electrode This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
Reference solution This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

Other hazards which do not result in classification : * P3211 electrode None known.
Reference solution None known.

SECTION 3: Composition/information on ingredients

3.1 Substances : * P3211 electrode Mixture (encapsulated in article)
Reference solution Mixture

Product/ingredient name	Identifiers	%	Classification	Specific Conc. Limits, M-factors and ATEs	Type
* P3211 electrode					
glycerol	REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥10 - ≤25	Not classified.	-	[2]
ethanediol	EC: 203-473-3 CAS: 107-21-1 Index: 603-027-00-1	≤5	Acute Tox. 4, H302	ATE [Oral] = 500 mg/kg	[1] [2]
silver chloride	EC: 232-033-3 CAS: 7783-90-6	≤3	Met. Corr. 1, H290 Repr. 1B, H360D Aquatic Acute 1, H400 Aquatic Chronic 1, H410	M [Acute] = 1000 M [Chronic] = 100	[1]
disodium hydrogenorthophosphate	EC: 231-448-7 CAS: 7558-79-4	≤3	Eye Irrit. 2, H319	-	[1]
Reference solution					
silver chloride	EC: 232-033-3 CAS: 7783-90-6	≤1	Met. Corr. 1, H290 Repr. 1B, H360D Aquatic Acute 1, H400 Aquatic Chronic 1, H410 See Section 16 for the full text of the H statements declared above.	M [Acute] = 1000 M [Chronic] = 100	[1]

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

Type
* P3211 electrode [1] Substance classified with a health or environmental hazard
Reference solution [2] Substance with a workplace exposure limit
[1] Substance classified with a health or environmental hazard

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact	: * P3211 electrode	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
	Reference solution	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
Inhalation	: * P3211 electrode	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
	Reference solution	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Skin contact	: * P3211 electrode	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
	Reference solution	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Ingestion	: * P3211 electrode	Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
	Reference solution	Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

SECTION 4: First aid measures

Protection of first-aiders	: * P3211 electrode	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
	Reference solution	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact	: * P3211 electrode Reference solution	No known significant effects or critical hazards. No known significant effects or critical hazards.
Inhalation	: * P3211 electrode Reference solution	No known significant effects or critical hazards. No known significant effects or critical hazards.
Skin contact	: * P3211 electrode Reference solution	No known significant effects or critical hazards. No known significant effects or critical hazards.
Ingestion	: * P3211 electrode Reference solution	No known significant effects or critical hazards. No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact	: * P3211 electrode Reference solution	No specific data. No specific data.
Inhalation	: * P3211 electrode Reference solution	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
Skin contact	: * P3211 electrode Reference solution	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
Ingestion	: * P3211 electrode Reference solution	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	: * P3211 electrode Reference solution	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
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SECTION 4: First aid measures

Specific treatments	: * P3211 electrode Reference solution	No specific treatment. No specific treatment.
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SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	: * P3211 electrode Reference solution	Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	: * P3211 electrode Reference solution	None known. None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture	: * P3211 electrode Reference solution	In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain. In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
Hazardous combustion products	: * P3211 electrode Reference solution	Decomposition products may include the following materials: carbon dioxide carbon monoxide phosphorus oxides halogenated compounds metal oxide/oxides Decomposition products may include the following materials: halogenated compounds metal oxide/oxides

5.3 Advice for firefighters

Special precautions for fire-fighters	: * P3211 electrode Reference solution	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
Special protective equipment for fire-fighters	: * P3211 electrode Reference solution	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

SECTION 6: Accidental release measures

For non-emergency personnel	: * P3211 electrode	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
	Reference solution	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	: * P3211 electrode	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
	Reference solution	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions	: * P3211 electrode	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.
	Reference solution	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up	: * P3211 electrode	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
	Reference solution	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other sections	: See Section 1 for emergency contact information. See Section 8 for information on appropriate personal protective equipment. See Section 13 for additional waste treatment information.
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SECTION 7: Handling and storage

7.1 Precautions for safe handling

SECTION 7: Handling and storage

Protective measures	: * P3211 electrode	Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapour or mist. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
	Reference solution	Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapour or mist. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
Advice on general occupational hygiene	: * P3211 electrode	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
	Reference solution	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

Storage	: * P3211 electrode	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
	Reference solution	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Seveso Directive - Reporting thresholds

SECTION 7: Handling and storage

Danger criteria

Category	Notification and MAPP threshold	Safety report threshold
* P3211 electrode E1	100 tonne	200 tonne
Reference solution E1	100 tonne	200 tonne

7.3 Specific end use(s)

Recommendations	: * P3211 electrode Reference solution	Industrial applications, Professional applications. Industrial applications, Professional applications.
Industrial sector specific solutions	: * P3211 electrode Reference solution	Not available. Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
* P3211 electrode Glycerol ethanediol	NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV: 10 mg/m ³ 8 hours. Form: mist NAOSH (Ireland, 5/2021). Absorbed through skin. Notes: EU derived Occupational Exposure Limit Values OELV: 104 mg/m ³ 15 minutes. OELV: 40 ppm 15 minutes. OELV: 52 mg/m ³ 8 hours. OELV: 20 ppm 8 hours.

Biological exposure indices

No exposure indices known.

Recommended monitoring procedures	: Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.
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DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
* P3211 electrode ethanediol	DNEL	Long term Inhalation	7 mg/m ³	General population	Local
	DNEL	Long term Inhalation	35 mg/m ³	Workers	Local
	DNEL	Long term Dermal	53 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	106 mg/kg bw/day	Workers	Systemic
Silver chloride	DNEL	Long term Inhalation	0.15 mg/m ³	General population	Systemic
	DNEL	Long term Inhalation	0.61 mg/m ³	Workers	Systemic
	DNEL	Long term Oral	0.11 mg/kg	General	Systemic

SECTION 8: Exposure controls/personal protection

Disodium hydrogenorthophosphate	DNEL	Long term Dermal	bw/day 0.11 mg/kg	population General	Systemic
	DNEL	Long term Dermal	bw/day 0.22 mg/kg	population Workers	Systemic
	DNEL	Long term Inhalation	bw/day 3.04 mg/m ³	General population	Systemic
	DNEL	Long term Inhalation	4.07 mg/m ³	Workers	Systemic
Reference solution Silver chloride	DNEL	Long term Inhalation	0.15 mg/m ³	General population	Systemic
	DNEL	Long term Inhalation	0.61 mg/m ³	Workers	Systemic
	DNEL	Long term Oral	0.11 mg/kg	General population	Systemic
	DNEL	Long term Dermal	bw/day 0.11 mg/kg	General population	Systemic
	DNEL	Long term Dermal	bw/day 0.22 mg/kg	Workers	Systemic

PNECs

No PNECs available

8.2 Exposure controls

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

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SECTION 8: Exposure controls/personal protection

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

9.1 Information on basic physical and chemical properties

Appearance

Physical state : * P3211 electrode Liquid.
Reference solution Liquid.

Colour : * P3211 electrode Not available.
Reference solution White.

Odour : * P3211 electrode Not available.
Reference solution Not available.

Odour threshold : * P3211 electrode Not available.
Reference solution Not available.

Melting point/freezing point : * P3211 electrode -25°C
Reference solution Not available.

Initial boiling point and boiling range : * P3211 electrode 110°C
Reference solution Not available.

Flammability : * P3211 electrode Not applicable.
Reference solution Not applicable.

Upper/lower flammability or explosive limits : * P3211 electrode Not available.
Reference solution Not available.

Flash point :

Ingredient name	Closed cup		Open cup	
	°C	Method	°C	Method
* P3211 electrode				
ethanediol	111	-	-	-
glycerol	-	-	177	-

Auto-ignition temperature :

Ingredient name	°C	Method
* P3211 electrode		
glycerol	370	-
ethanediol	398	-

Decomposition temperature : * P3211 electrode Not available.
Reference solution Not available.

pH : * P3211 electrode 6
Reference solution 6

Viscosity : * P3211 electrode Not available.
Reference solution Not available.

Solubility(ies) :

Media	Result
* P3211 electrode	
water	Soluble
Reference solution	
water	Soluble

Partition coefficient: n-octanol/water : * P3211 electrode Not applicable.
Reference solution Not applicable.

Vapour pressure :

SECTION 9: Physical and chemical properties

Ingredient name	Vapour Pressure at 20°C			Vapour pressure at 50°C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
* P3211 electrode						
water	17.5	2.3	-	92.258	12.3	-
ethanediol	0.09226	0.012	-	-	-	-
Reference solution						
water	17.5	2.3	-	92.258	12.3	-

Evaporation rate	: * P3211 electrode	Not available.
	Reference solution	Not available.
Relative density	: * P3211 electrode	1.1
	Reference solution	1
Vapour density	: * P3211 electrode	Not available.
	Reference solution	Not available.
Explosive properties	: * P3211 electrode	Not available.
	Reference solution	Not available.
Oxidising properties	: * P3211 electrode	Not available.
	Reference solution	Not available.
Particle characteristics		
Median particle size	: * P3211 electrode	Not applicable.
	Reference solution	Not applicable.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity	: * P3211 electrode	No specific test data related to reactivity available for this product or its ingredients.
	Reference solution	No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	: * P3211 electrode	The product is stable.
	Reference solution	The product is stable.
10.3 Possibility of hazardous reactions	: * P3211 electrode	Under normal conditions of storage and use, hazardous reactions will not occur.
	Reference solution	Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid	: * P3211 electrode	No specific data.
	Reference solution	No specific data.
10.5 Incompatible materials	: * P3211 electrode	May react or be incompatible with oxidising materials.
	Reference solution	May react or be incompatible with oxidising materials.
10.6 Hazardous decomposition products	: * P3211 electrode	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	Reference solution	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
* P3211 electrode				
ethanediol	LD50 Oral	Rat	4700 mg/kg	-
Silver chloride	LD50 Oral	Rat	>5000 mg/kg	-
Disodium hydrogenorthophosphate	LD50 Oral	Rat	17000 mg/kg	-
Reference solution				
Silver chloride	LD50 Oral	Rat	>5000 mg/kg	-

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
* P3211 electrode					
* P3211 electrode	16666.7	N/A	N/A	N/A	N/A
ethanediol	500	9500	N/A	N/A	N/A
Disodium hydrogenorthophosphate	17000	N/A	N/A	N/A	N/A

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
* P3211 electrode					
ethanediol	Eyes - Mild irritant	Rabbit	-	1 hours 100 mg	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Eyes - Moderate irritant	Rabbit	-	6 hours 1440 mg	-
Disodium hydrogenorthophosphate	Skin - Mild irritant	Rabbit	-	555 mg	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-

Sensitiser

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on likely routes of exposure : * P3211 electrode Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
Reference solution Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

SECTION 11: Toxicological information

Potential acute health effects

Inhalation	:	* P3211 electrode Reference solution	No known significant effects or critical hazards. No known significant effects or critical hazards.
Ingestion	:	* P3211 electrode Reference solution	No known significant effects or critical hazards. No known significant effects or critical hazards.
Skin contact	:	* P3211 electrode Reference solution	No known significant effects or critical hazards. No known significant effects or critical hazards.
Eye contact	:	* P3211 electrode Reference solution	No known significant effects or critical hazards. No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation	:	* P3211 electrode Reference solution	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
Ingestion	:	* P3211 electrode Reference solution	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
Skin contact	:	* P3211 electrode Reference solution	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
Eye contact	:	* P3211 electrode Reference solution	No specific data. No specific data.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Conclusion/Summary	:	Not available.	
General	:	* P3211 electrode Reference solution	No known significant effects or critical hazards. No known significant effects or critical hazards.
Carcinogenicity	:	* P3211 electrode Reference solution	No known significant effects or critical hazards. No known significant effects or critical hazards.
Mutagenicity	:	* P3211 electrode Reference solution	No known significant effects or critical hazards. No known significant effects or critical hazards.

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SECTION 11: Toxicological information

Reproductive toxicity : * P3211 electrode May damage the unborn child.
Reference solution May damage the unborn child.

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Not available.

11.2.2 Other information

Not available.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
* P3211 electrode ethanediol	Acute LC50 6900000 µg/l Fresh water	Crustaceans - <i>Ceriodaphnia dubia</i> - Neonate	48 hours
	Acute LC50 41000 mg/l Fresh water	Daphnia - <i>Daphnia magna</i> - Neonate	48 hours
Silver chloride	Acute LC50 8050000 µg/l Fresh water	Fish - <i>Pimephales promelas</i>	96 hours
	Acute EC50 0.00022 mg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute LC50 5.3 µg/l Fresh water	Fish - <i>Lepidocephalichthys guntea</i>	96 hours
Disodium hydrogenorthophosphate	Acute EC50 >100 mg/l Fresh water	Algae - <i>Desmodesmus subspicatus</i>	72 hours
	Acute LC50 3580000 µg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute LC50 >100 mg/l Fresh water	Fish - <i>Oncorhynchus mykiss</i>	96 hours
	Acute NOEC >100 mg/l Fresh water	Algae - <i>Desmodesmus subspicatus</i>	72 hours
	Acute NOEC >100 mg/l Fresh water Acute NOEC 100 mg/l Fresh water	Daphnia - <i>Daphnia magna</i> Fish - <i>Oncorhynchus mykiss</i>	48 hours 96 hours
Reference solution Silver chloride	Acute EC50 0.00022 mg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute LC50 5.3 µg/l Fresh water	Fish - <i>Lepidocephalichthys guntea</i>	96 hours

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
* P3211 electrode ethanediol	OECD 301A Ready Biodegradability - DOC Die-Away Test	90 to 100 % - Readily - 10 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
* P3211 electrode ethanediol	-	-	Readily

12.3 Bioaccumulative potential

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SECTION 12: Ecological information

Product/ingredient name	LogP _{ow}	BCF	Potential
* P3211 electrode			
ethanediol	-1.36	-	Low
Silver chloride	-	70	Low
Disodium hydrogenorthophosphate	-5.8	-	Low
Reference solution			
Silver chloride	-	70	Low

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

12.6 Endocrine disrupting properties

Not available.

12.7 Other adverse effects

No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

Hazardous waste : The classification of the product may meet the criteria for a hazardous waste.

Packaging

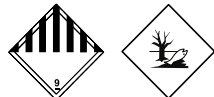
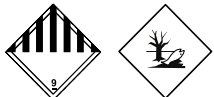
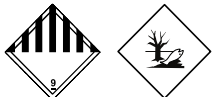
Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	IMDG	IATA
14.1 UN number or ID number	UN3082	UN3082	UN3082
14.2 UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Silver chloride)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Silver chloride)	Environmentally hazardous substance, liquid, n.o.s. (Silver chloride)

SECTION 14: Transport information

14.3 Transport hazard class(es)	9 	9 	9 
14.4 Packing group	III	III	III
14.5 Environmental hazards	Yes.	Yes.	Yes.

Additional information

- ADR/RID** : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.
Hazard identification number 90
Limited quantity 5 L
Special provisions 274, 335, 601, 375
Tunnel code (-)
- IMDG** : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.
Emergency schedules F-A, S-F
Special provisions 274, 335, 969
- IATA** : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.
Quantity limitation Passenger and Cargo Aircraft: 450 L. Packaging instructions: 964. Cargo Aircraft Only: 450 L. Packaging instructions: 964. Limited Quantities - Passenger Aircraft: 30 kg. Packaging instructions: Y964.
Special provisions A97, A158, A197, A215
- 14.6 Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.
- 14.7 Transport in bulk according to IMO instruments** : Not available.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

P3211 pH combination electrode, Part Number 5190-3988

SECTION 15: Regulatory information

Republic of Korea	: All components are listed or exempted.
Taiwan	: All components are listed or exempted.
Thailand	: Not determined.
Turkey	: Not determined.
United States	: All components are active or exempted.
Viet Nam	: All components are listed or exempted.

15.2 Chemical safety assessment : This product contains substances for which Chemical Safety Assessments might still be required.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms	: ATE = Acute Toxicity Estimate CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008] DMEL = Derived Minimal Effect Level DNEL = Derived No Effect Level EUH statement = CLP-specific Hazard statement N/A = Not available PBT = Persistent, Bioaccumulative and Toxic PNEC = Predicted No Effect Concentration RRN = REACH Registration Number vPvB = Very Persistent and Very Bioaccumulative
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Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
* P3211 electrode Repr. 1B, H360D Aquatic Acute 1, H400 Aquatic Chronic 1, H410 Reference solution Repr. 1B, H360D Aquatic Acute 1, H400 Aquatic Chronic 1, H410	Calculation method Calculation method Calculation method Calculation method Calculation method Calculation method

Full text of abbreviated H statements

* P3211 electrode H290 H302 H319 H360D H400 H410 Reference solution H290 H360D H400 H410	May be corrosive to metals. Harmful if swallowed. Causes serious eye irritation. May damage the unborn child. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects. May be corrosive to metals. May damage the unborn child. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.
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Full text of classifications [CLP/GHS]

P3211 pH combination electrode, Part Number 5190-3988

SECTION 16: Other information

<p>* P3211 electrode Acute Tox. 4 Aquatic Acute 1 Aquatic Chronic 1 Eye Irrit. 2 Met. Corr. 1 Repr. 1B</p> <p>Reference solution Aquatic Acute 1 Aquatic Chronic 1 Met. Corr. 1 Repr. 1B</p>	<p>ACUTE TOXICITY - Category 4 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2 CORROSIVE TO METALS - Category 1 REPRODUCTIVE TOXICITY - Category 1B</p> <p>SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1 CORROSIVE TO METALS - Category 1 REPRODUCTIVE TOXICITY - Category 1B</p>
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Date of issue/ Date of revision : 12/04/2024

Date of previous issue : No previous validation

Version : 1

Note * : * This product is considered an article. This Safety Data Sheet is written based on the encapsulated substance or mixture in this article. This article, when used under reasonable conditions and in accordance with the directions for use, should not present a health hazard. The substance or mixture is encapsulated in the article. Only if released due to use or processing of the article in a manner not in accordance with the product’s directions for use it may present potential health and safety hazards.

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