

# SAFETY DATA SHEET



P3211 pH combination electrode, Part Number 5190-3988

## Section 1. Identification

### 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  
**Validation date** : 4/12/2024

### 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

### 1.3 Details of the supplier of the safety data sheet

**Supplier/Manufacturer** : Agilent Technologies, Inc.  
 5301 Stevens Creek Blvd  
 Santa Clara, CA 95051, USA  
 800-227-9770

### 1.4 Emergency telephone number

**In case of emergency** : CHEMTREC®: 1-800-424-9300

**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

**OSHA/HCS status** :  P3211 electrode This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).  
 Reference solution This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

### Classification of the substance or mixture

**P3211 electrode**  
 H319 EYE IRRITATION - Category 2A  
 H360 TOXIC TO REPRODUCTION - Category 1B  
 H373 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2  
 H400 AQUATIC HAZARD (ACUTE) - Category 1  
 H410 AQUATIC HAZARD (LONG-TERM) - Category 1

### Reference solution

H320 EYE IRRITATION - Category 2B  
 H360 TOXIC TO REPRODUCTION - Category 1B  
 H400 AQUATIC HAZARD (ACUTE) - Category 1  
 H410 AQUATIC HAZARD (LONG-TERM) - Category 1

### 2.2 GHS label elements

## Section 2. Hazards identification

**Hazard pictograms** : P3211 electrode



Reference solution



**Signal word** : P3211 electrode  
Reference solution

Danger  
Danger

**Hazard statements** : P3211 electrode

H319 - Causes serious eye irritation.  
H360 - May damage fertility or the unborn child.  
H373 - May cause damage to organs through prolonged or repeated exposure.  
H410 - Very toxic to aquatic life with long lasting effects.  
Reference solution  
H320 - Causes eye irritation.  
H360 - May damage fertility or 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.  
P260 - Do not breathe vapor.  
Reference solution  
P201 - Obtain special instructions before use.  
P280 - Wear protective gloves, protective clothing and eye or face protection.  
P273 - Avoid release to the environment.

**Response** : P3211 electrode

P391 - Collect spillage.  
P308 + P313 - IF exposed or concerned: Get medical advice or attention.  
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P337 + P313 - If eye irritation persists: Get medical advice or attention.  
Reference solution  
P391 - Collect spillage.  
P308 + P313 - IF exposed or concerned: Get medical advice or attention.  
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P337 + P313 - If eye irritation persists: Get medical advice or attention.

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

## Section 2. Hazards identification

**Supplemental label elements** : \*P3211 electrode None known.  
Reference solution None known.

### 2.3 Other hazards

**Hazards not otherwise classified** : \*P3211 electrode None known.  
Reference solution None known.

## Section 3. Composition/information on ingredients

**Substance/mixture** : \*P3211 electrode Mixture (encapsulated in article)  
Reference solution Mixture

Ingredient name	%	CAS number
*P3211 electrode		
Glycerol	≥10 - ≤25	56-81-5
Potassium chloride	≤10	7447-40-7
Ethenediol	≤5	107-21-1
Silver chloride	≤3	7783-90-6
Disodium hydrogenorthophosphate	≤3	7558-79-4
<b>Reference solution</b>		
Potassium chloride	≥10 - ≤25	7447-40-7
Silver chloride	≤1	7783-90-6

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

**There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.**

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

## Section 4. First aid measures

### 4.1 Description of necessary first aid measures

**Eye contact** : \*P3211 electrode  
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.

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. If irritation persists, get medical attention.

**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.

## Section 4. First aid measures

Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. 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.

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.

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.

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. 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

**Skin contact** : P3211 electrode

Reference solution

**Ingestion** : P3211 electrode

Reference solution

### 4.2 Most important symptoms/effects, acute and delayed

#### Potential acute health effects

**Eye contact** : P3211 electrode  
Reference solution

Causes serious eye irritation.  
Causes eye irritation.

## Section 4. First aid measures

<b>Inhalation</b>	: P3211 electrode Reference solution	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Skin contact</b>	: P3211 electrode Reference solution	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Ingestion</b>	: P3211 electrode Reference solution	No known significant effects or critical hazards. No known significant effects or critical hazards.

### Over-exposure signs/symptoms

<b>Eye contact</b>	: P3211 electrode  Reference solution	Adverse symptoms may include the following: pain or irritation watering redness Adverse symptoms may include the following: irritation watering redness
<b>Inhalation</b>	: P3211 electrode  Reference solution	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations
<b>Skin contact</b>	: P3211 electrode  Reference solution	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations
<b>Ingestion</b>	: P3211 electrode  Reference solution	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations

### 4.3 Indication of immediate medical attention and special treatment needed, if necessary

<b>Notes to physician</b>	: 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.
<b>Specific treatments</b>	: P3211 electrode Reference solution	No specific treatment. No specific treatment.
<b>Protection of first-aiders</b>	: 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

## Section 4. First aid measures

Reference solution

before removing it, or wear gloves.  
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.

See toxicological information (Section 11)

## Section 5. Fire-fighting 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

**Specific hazards arising from the chemical**

: 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 thermal decomposition 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 protective actions 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.

## Section 5. Fire-fighting measures

**Special protective equipment for fire-fighters** : P3211 electrode

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

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.

## Section 6. Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

**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 spilled material. Avoid breathing vapor 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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : P3211 electrode

If specialized 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". If specialized 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

**6.2 Environmental precautions** : P3211 electrode

Avoid dispersal of spilled 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 spilled 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 materials for containment and cleaning up

## Section 6. Accidental release measures

**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.

## Section 7. Handling and storage

### 7.1 Precautions for safe handling

**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 breathe vapor or mist. Do not ingest. 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 vapor 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.



## Section 7. Handling and storage

### 7.2 Conditions for safe storage, including any incompatibilities

: 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 unlabeled 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 unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

### 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

Ingredient name	Exposure limits
P3211 electrode Glycerol      Potassium chloride Ethanediol	<p><b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 5 mg/m<sup>3</sup> 8 hours. Form: Respirable fraction TWA: 10 mg/m<sup>3</sup> 8 hours. Form: Total dust</p> <p><b>OSHA PEL (United States, 5/2018).</b> TWA: 5 mg/m<sup>3</sup> 8 hours. Form: Respirable fraction TWA: 15 mg/m<sup>3</sup> 8 hours. Form: Total dust</p> <p><b>CAL OSHA PEL (United States, 5/2018).</b> TWA: 5 mg/m<sup>3</sup> 8 hours. Form: respirable fraction TWA: 10 mg/m<sup>3</sup> 8 hours. Form: total dust</p> <p>None.</p> <p><b>ACGIH TLV (United States, 1/2023).</b> STEL: 10 mg/m<sup>3</sup> 15 minutes. Form: Inhalable fraction. Aerosol only. STEL: 50 ppm 15 minutes. Form: Vapor fraction</p>

## Section 8. Exposure controls/personal protection

Silver chloride	TWA: 25 ppm 8 hours. Form: Vapor fraction <b>OSHA PEL 1989 (United States, 3/1989).</b> CEIL: 50 ppm CEIL: 125 mg/m <sup>3</sup> <b>CAL OSHA PEL (United States, 5/2018).</b> C: 100 mg/m <sup>3</sup> Form: vapor C: 40 ppm Form: vapor <b>ACGIH TLV (United States).</b> TWA: 0.1 mg/m <sup>3</sup> , (Silver.) Form: Dust and fumes
Disodium hydrogenorthophosphate	None.
<b>Reference solution</b>	
Potassium chloride	None.
Silver chloride	<b>ACGIH TLV (United States).</b> TWA: 0.1 mg/m <sup>3</sup> , (Silver.) Form: Dust and fumes

### Biological exposure indices

No exposure indices known.

### 8.2 Exposure controls

- Appropriate engineering controls** : If user operations generate dust, fumes, gas, vapor 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.
- 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.

### 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: chemical splash goggles.
- 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.

## Section 8. Exposure controls/personal protection

- 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.

## Section 9. Physical and chemical properties and safety characteristics

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

### Appearance

- Physical state** : P3211 electrode Liquid.  
Reference solution Liquid.
- Color** : P3211 electrode Not available.  
Reference solution White.
- Odor** : P3211 electrode Not available.  
Reference solution Not available.
- Odor threshold** : P3211 electrode Not available.  
Reference solution Not available.
- pH** : P3211 electrode 6  
Reference solution 6
- Melting point/freezing point** : P3211 electrode -25°C (-13°F)  
Reference solution Not available.
- Boiling point, initial boiling point, and boiling range** : P3211 electrode 110°C (230°F)  
Reference solution Not available.

### Flash point

Ingredient name	Closed cup			Open cup		
	°C	°F	Method	°C	°F	Method
P3211 electrode						
Ethanediol	111	231.8	-	-	-	-
Glycerol	-	-	-	177	350.6	-

- Evaporation rate** : P3211 electrode Not available.  
Reference solution Not available.
- Flammability** : P3211 electrode Not applicable.  
Reference solution Not applicable.
- Lower and upper explosion limit/flammability limit** : P3211 electrode Not available.  
Reference solution Not available.

### Vapor pressure

Ingredient name	Vapor Pressure at 20°C			Vapor 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	-

- Relative vapor density** : P3211 electrode Not available.  
Reference solution Not available.
- Relative density** : P3211 electrode 1.1  
Reference solution 1

## Section 9. Physical and chemical properties and safety characteristics

<b>Solubility(ies)</b>	<b>Media</b>	<b>Result</b>		
	*P3211 electrode water <b>Reference solution</b> water	Soluble  Soluble		
<b>Partition coefficient: n-octanol/water</b>	*P3211 electrode	Not applicable.		
	Reference solution	Not applicable.		
<b>Auto-ignition temperature</b>	<b>Ingredient name</b>	<b>°C</b>	<b>°F</b>	<b>Method</b>
	*P3211 electrode			
	Glycerol	370	698	-
	Ethenediol	398	748.4	-
<b>Decomposition temperature</b>	*P3211 electrode	Not available.		
	Reference solution	Not available.		
<b>Viscosity</b>	*P3211 electrode	Not available.		
	Reference solution	Not available.		
<b>Particle characteristics</b>				
<b>Median particle size</b>	*P3211 electrode	Not applicable.		
	Reference solution	Not applicable.		

## Section 10. Stability and reactivity

<b>10.1 Reactivity</b>	*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.
<b>10.2 Chemical stability</b>	*P3211 electrode	The product is stable.
	Reference solution	The product is stable.
<b>10.3 Possibility of hazardous reactions</b>	*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.
<b>10.4 Conditions to avoid</b>	*P3211 electrode	No specific data.
	Reference solution	No specific data.
<b>10.5 Incompatible materials</b>	*P3211 electrode	May react or be incompatible with oxidizing materials.
	Reference solution	May react or be incompatible with oxidizing materials.
<b>10.6 Hazardous decomposition products</b>	*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
<b>P3211 electrode</b>				
Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Potassium chloride	LD50 Oral	Rat	2600 mg/kg	-
Ethanediol	LD50 Oral	Rat	4700 mg/kg	-
Silver chloride	LD50 Oral	Rat	>5000 mg/kg	-
Disodium hydrogenorthophosphate	LD50 Oral	Rat	17000 mg/kg	-
<b>Reference solution</b>				
Potassium chloride	LD50 Oral	Rat	2600 mg/kg	-
Silver chloride	LD50 Oral	Rat	>5000 mg/kg	-

#### Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
<b>P3211 electrode</b>					
Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Potassium chloride	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
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	-
<b>Reference solution</b>					
Potassium chloride	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-

#### Sensitization

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)

## Section 11. Toxicological information

Name	Category	Route of exposure	Target organs
*P3211 electrode Ethanediol	Category 3	-	Respiratory tract irritation

### Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
*P3211 electrode Ethanediol	Category 2	oral	kidneys

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : \*P3211 electrode  
Reference solution

Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

### Potential acute health effects

**Eye contact** : \*P3211 electrode  
Reference solution

Causes serious eye irritation.  
Causes eye irritation.

**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.

### Symptoms related to the physical, chemical and toxicological characteristics

**Eye contact** : \*P3211 electrode  
  
Reference solution

Adverse symptoms may include the following:  
pain or irritation  
watering  
redness  
Adverse symptoms may include the following:  
irritation  
watering  
redness

**Inhalation** : \*P3211 electrode  
  
Reference solution

Adverse symptoms may include the following:  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations  
Adverse symptoms may include the following:  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations

**Skin contact** : \*P3211 electrode  
  
Reference solution

Adverse symptoms may include the following:  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations  
Adverse symptoms may include the following:  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations

## Section 11. Toxicological information

<b>Ingestion</b>	: P3211 electrode	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations
	Reference solution	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations

### Delayed and immediate effects and also 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

<b>General</b>	: P3211 electrode	May cause damage to organs through prolonged or repeated exposure.
	Reference solution	No known significant effects or critical hazards.
<b>Carcinogenicity</b>	: P3211 electrode	No known significant effects or critical hazards.
	Reference solution	No known significant effects or critical hazards.
<b>Mutagenicity</b>	: P3211 electrode	No known significant effects or critical hazards.
	Reference solution	No known significant effects or critical hazards.
<b>Reproductive toxicity</b>	: P3211 electrode	May damage fertility or the unborn child.
	Reference solution	May damage fertility or the unborn child.

### Numerical measures of toxicity

#### Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
<b>P3211 electrode</b>					
* P3211 electrode	10691.3	166666.7	N/A	N/A	N/A
Glycerol	12600	N/A	N/A	N/A	N/A
Potassium chloride	2600	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
<b>Reference solution</b>					
Reference solution	11158.8	N/A	N/A	N/A	N/A
Potassium chloride	2600	N/A	N/A	N/A	N/A

## Section 12. Ecological information

### 12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
P3211 electrode Glycerol Potassium chloride	Acute LC50 54000 mg/l Fresh water	Fish - <i>Oncorhynchus mykiss</i>	96 hours
	Acute EC50 9.24 g/L Fresh water	Algae - <i>Desmodesmus subspicatus</i>	72 hours
Ethanediol	Acute EC50 1337000 µg/l Fresh water	Algae - <i>Navicula seminulum</i>	96 hours
	Acute LC50 9.68 mg/l Fresh water	Crustaceans - <i>Pseudosida ramosa</i> - Neonate	48 hours
	Acute LC50 93000 µg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute LC50 509.65 mg/l Fresh water	Fish - <i>Danio rerio</i>	96 hours
Silver chloride	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
	Acute LC50 8050000 µg/l Fresh water	Fish - <i>Pimephales promelas</i>	96 hours
Disodium hydrogenorthophosphate	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
	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
Reference solution Potassium chloride	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	Daphnia - <i>Daphnia magna</i>	48 hours
Silver chloride	Acute NOEC 100 mg/l Fresh water	Fish - <i>Oncorhynchus mykiss</i>	96 hours
	Acute EC50 9.24 g/L Fresh water	Algae - <i>Desmodesmus subspicatus</i>	72 hours
	Acute EC50 1337000 µg/l Fresh water	Algae - <i>Navicula seminulum</i>	96 hours
	Acute LC50 9.68 mg/l Fresh water	Crustaceans - <i>Pseudosida ramosa</i> - Neonate	48 hours
	Acute LC50 93000 µg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
Silver chloride	Acute LC50 509.65 mg/l Fresh water	Fish - <i>Danio rerio</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

### 12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
P3211 electrode Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
	Ethanediol	OECD 301A Ready Biodegradability - DOC Die-Away Test	90 to 100 % - Readily - 10 days	-



## Section 12. Ecological information

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
<b>* P3211 electrode</b>			
Potassium chloride	-	-	Readily
Ethenediol	-	-	Readily
<b>Reference solution</b>			
Potassium chloride	-	-	Readily

### 12.3 Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
<b>* P3211 electrode</b>			
Glycerol	-1.76	-	Low
Potassium chloride	-0.46	-	Low
Ethenediol	-1.36	-	Low
Silver chloride	-	70	Low
Disodium hydrogenorthophosphate	-5.8	-	Low
<b>Reference solution</b>			
Potassium chloride	-0.46	-	Low
Silver chloride	-	70	Low

### 12.4 Mobility in soil

**Soil/water partition coefficient (K<sub>oc</sub>)** : Not available.

**12.5 Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

### 13.1 Waste treatment methods

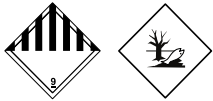
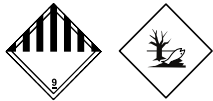
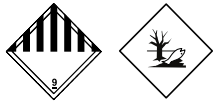

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. 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. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. 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 spilled material and runoff and contact with soil, waterways, drains and sewers.

**Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.**

**The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.**

**Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.**

## Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	IMDG	IATA
UN number	Not regulated.	UN3082	UN3082	UN3082	UN3082
UN proper shipping name		ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Silver chloride)	SUBSTANCIA LIQUIDA POTENCIALMENTE PELIGROSA PARA EL MEDIO AMBIENTE, N.E.P. (Silver chloride)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Silver chloride)	Environmentally hazardous substance, liquid, n. o.s. (Silver chloride)
Transport hazard class(es)		9 	9 	9 	9 
Packing group		III	III	III	III
Environmental hazards	No.	Yes.	Yes.	Yes.	Yes.

### Additional information

#### TDG Classification

: Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.43-2.45 (Class 9), 2.7 (Marine pollutant mark). Non-bulk packages of this product are not regulated as dangerous goods when transported by road or rail.

#### **Explosive Limit and Limited Quantity Index 5**

**Special provisions** 16, 99

#### Mexico Classification

: The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.

**Special provisions** 274, 331, 335

#### 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

#### 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.

#### 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](#)

**U.S. Federal regulations** : TSCA 8(a) CDR Exempt/Partial exemption: Not determined  
 Clean Water Act (CWA) 307: Silver chloride  
 Clean Water Act (CWA) 311: Disodium hydrogenorthophosphate

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Listed

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

#### [SARA 302/304](#)

##### [Composition/information on ingredients](#)


No products were found.

**SARA 304 RQ** : Not applicable.

#### [SARA 311/312](#)

**Classification** :  P3211 electrode  
 Reference solution  
 EYE IRRITATION - Category 2A  
 TOXIC TO REPRODUCTION - Category 1B  
 EYE IRRITATION - Category 2B  
 TOXIC TO REPRODUCTION - Category 1B

##### [Composition/information on ingredients](#)

Name	%	Classification
 <b>P3211 electrode</b>		
Glycerol	≥10 - ≤25	EYE IRRITATION - Category 2B
Potassium chloride	≤10	EYE IRRITATION - Category 2B
Ethenediol	≤5	ACUTE TOXICITY (oral) - Category 4 EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
Silver chloride	≤3	CORROSIVE TO METALS - Category 1 TOXIC TO REPRODUCTION - Category 1B EYE IRRITATION - Category 2B
Disodium hydrogenorthophosphate	≤3	
<b>Reference solution</b>		
Potassium chloride	≥10 - ≤25	EYE IRRITATION - Category 2B
Silver chloride	≤1	CORROSIVE TO METALS - Category 1 TOXIC TO REPRODUCTION - Category 1B

#### [SARA 313](#)

	Product name	CAS number	%
<b>Form R - Reporting requirements</b>	* <b>P3211 electrode</b>		
	Ethenediol	107-21-1	≤5
	Silver chloride	7783-90-6	≤3
<b>Supplier notification</b>	* <b>P3211 electrode</b>		
	Ethenediol	107-21-1	≤5
	Silver chloride	7783-90-6	≤3

## Section 15. Regulatory information

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

### State regulations

- Massachusetts** : The following components are listed: GLYCERINE MIST; ETHYLENE GLYCOL  
**New York** : The following components are listed: Ethylene glycol  
**New Jersey** : The following components are listed: GLYCERIN; ETHYLENE GLYCOL  
**Pennsylvania** : The following components are listed: 1,2,3-PROPANETRIOL; 1,2-ETHANEDIOL  
**California Prop. 65**

**⚠ WARNING:** This product can expose you to Ethylene Glycol, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

Ingredient name	No significant risk level	Maximum acceptable dosage level
* P3211 electrode Ethylene Glycol	-	Yes.

### International regulations

#### Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

#### Montreal Protocol

Not listed.

#### Stockholm Convention on Persistent Organic Pollutants

Not listed.

#### Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

#### UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

### Inventory list

- Australia** : All components are listed or exempted.  
**Canada** : All components are listed or exempted.  
**China** : All components are listed or exempted.  
**Japan** : **Japan inventory (CSCL):** All components are listed or exempted.  
**Japan inventory (ISHL):** All components are listed or exempted.  
**New Zealand** : All components are listed or exempted.  
**Philippines** : All components are listed or exempted.  
**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.

## Section 16. Other information

### Procedure used to derive the classification

Classification	Justification
<b>❏ P3211 electrode</b> EYE IRRITATION - Category 2A TOXIC TO REPRODUCTION - Category 1B SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2 AQUATIC HAZARD (ACUTE) - Category 1 AQUATIC HAZARD (LONG-TERM) - Category 1	Calculation method Calculation method Calculation method Calculation method Calculation method
<b>Reference solution</b> EYE IRRITATION - Category 2B TOXIC TO REPRODUCTION - Category 1B AQUATIC HAZARD (ACUTE) - Category 1 AQUATIC HAZARD (LONG-TERM) - Category 1	Calculation method Calculation method Calculation method Calculation method

### History

**Date of issue/Date of revision** : 04/12/2024

**Date of previous issue** : 07/09/2020

**Version** : 6

**Key to abbreviations** : ATE = Acute Toxicity Estimate  
 BCF = Bioconcentration Factor  
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals  
 IATA = International Air Transport Association  
 IBC = Intermediate Bulk Container  
 IMDG = International Maritime Dangerous Goods  
 LogPow = logarithm of the octanol/water partition coefficient  
 MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)  
 N/A = Not available  
 UN = United Nations

❏ Indicates information that has changed from previously issued version.

### Notice to reader

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**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.