

**Nafion® perfluorinated resin, powder / D2021  
Nafion Dispersion - Alcohol based 1100 EW at  
20 wt%**

**Contamination Clearance Chemical Safety Approval**

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INUP Users



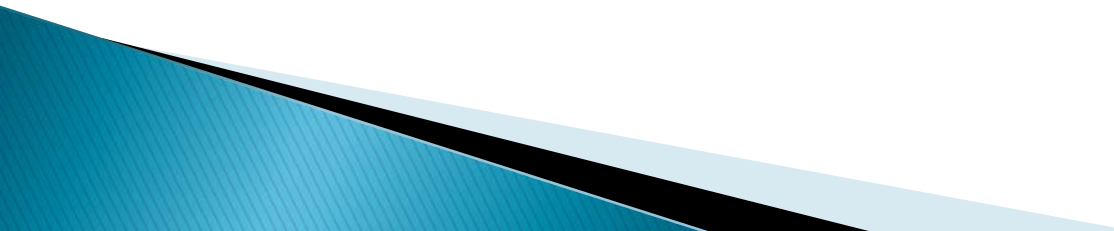
# Outline

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# About the Chemical

- ❖ Nafion® perfluorinated resin, powder is a stable material
- ❖ Nafion powder or Nafion dispersed solution of alcohol will be used to make a membrane on carbon paper using Doctor blade technique in EC Lab.

# Chemicals to be Used

- ❖ D2021 Nafion Dispersion - Alcohol
  - ❖ Nafion Powder
  - ❖ Ruthenium Black Powder
  - ❖ Platinum Black Powder
  - ❖ Toray Carbon Paper
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# Overview of Process

## (b) Anode Assembly

- 1 Preparation of Pt/Ru paste (using acetone) Layer on Carbon paper using Doctor blade technique
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- 2 Preparation of Nafion membrane on Pt/Ru paste (using acetone) using Doctor blade technique
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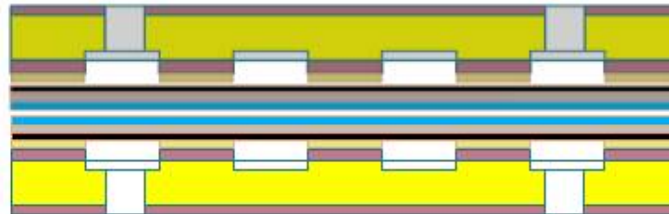
## (c) Cathode Assembly

- 1 Preparation of Pt paste (using acetone) Layer on Carbon paper using Doctor blade technique
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- 2 Preparation of Nafion membrane on Pt paste (using acetone) using Doctor blade technique
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## (d) Integration of Anode and Cathode

Forming a sandwich between two micro channels



# HAZARDS IDENTIFICATION

## **Classification of the substance or mixture**

Not a hazardous substance or mixture according to Regulation (EC) No. 1272/2008.

## **Label elements**

Not a hazardous substance or mixture according to Regulation (EC) No. 1272/2008.

## **Other hazards**

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

# COMPOSITION/INFORMATION ON INGREDIENTS

**Ethanesulfonic acid, 2-[1-[difluoro  
[(1,2,2-trifluoroethenyl)oxy]methyl]  
-1,2,2,2-tetrafluoroethoxy]-  
1,1,2,2-tetrafluoro-, polymer**

# FIRST AID MEASURES

## Description of first aid measures

### If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration.

### In case of skin contact

Wash off with soap and plenty of water.

### In case of eye contact

Flush eyes with water as a precaution.

### If swallowed

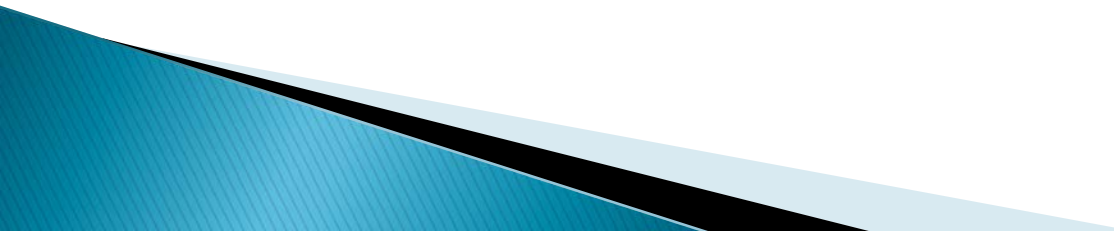
Never give anything by mouth to an unconscious person. Rinse mouth with water.

### Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

### Indication of any immediate medical attention and special treatment needed

No data available





# Firefighting measures

## **Extinguishing media**

### **Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

### **Special hazards arising from the substance or mixture**

Nature of decomposition products not known.

### **Advice for firefighters**

Wear self-contained breathing apparatus for firefighting if necessary.

### **Further information**

No data available



# ACCIDENTAL RELEASE MEASURES

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

Avoid dust formation. Avoid breathing vapours, mist or gas.

For personal protection see section 8.

## **Environmental precautions**

No special environmental precautions required.

## **Methods and materials for containment and cleaning up**

Sweep up and shovel. Keep in suitable, closed containers for disposal.

## **Reference to other sections**

For disposal see section 13.

# HANDLING AND STORAGE

## **Precautions for safe handling**

Provide appropriate exhaust ventilation at places where dust is formed.  
For precautions see section 2.2.

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

Store in cool place. Keep container tightly closed in a dry and well-ventilated place.  
Storage class (TRGS 510): Non Combustible Solids

## **Specific end use(s)**

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

# Exposure controls/personal protection

## Exposure controls

### Appropriate engineering controls

General industrial hygiene practice.

## Personal protective equipment

### Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

### Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

### Body Protection

Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

# Physical and chemical properties

## Information on basic physical and chemical properties

a) Appearance	Form: solid
b) Odour	No data available
c) Odour Threshold	No data available
d) pH	No data available
e) Melting point/freezing point	Melting point/range: 350 °C
f) Initial boiling point and boiling range	No data available
g) Flash point	No data available
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available
j) Upper/lower	No data available

## Stability and reactivity

### **Reactivity**

No data available

### **Chemical stability**

Stable under recommended storage conditions.

### **Possibility of hazardous reactions**

No data available

### **Conditions to avoid**

Avoid moisture.

### **Incompatible materials**

Strong oxidizing agents, Strong acids

### **Hazardous decomposition products**

Other decomposition products - No data available

In the event of fire: see section 5



# Toxicological information

## Information on toxicological effects

### Acute toxicity

No data available

### Skin corrosion/irritation

No data available

### Serious eye damage/eye irritation

May irritate eyes.

### Respiratory or skin sensitisation

No data available

### Germ cell mutagenicity

### Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

# Ecological information

## **Toxicity**

No data available

## **Persistence and degradability**

No data available

## **Bioaccumulative potential**

No data available

## **Mobility in soil**

No data available

## **Results of PBT and vPvB assessment**

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.



## Disposal considerations

### **Waste treatment methods**

#### **Product**

Offer surplus and non-recyclable solutions to a licensed disposal company

#### **Contaminated packaging**

Dispose of as unused product.

# Transport information

## UN number

ADR/RID: -

IMDG: -

IATA: -

## UN proper shipping name

ADR/RID: Not dangerous goods

IMDG: Not dangerous goods

IATA: Not dangerous goods

## Transport hazard class(es)

ADR/RID: -

IMDG: -

IATA: -

## Packaging group

ADR/RID: -

IMDG: -

IATA: -

THANK YOU