

Proton Polymer Electrolytes in Fuel Cell

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Abstract. Electrolyte is one of the main parts of fuel cell. That is divided to liquid and solid and it is used in both Alkaline and acidulous PH. Fuel cell have different divisions. But with due to kind of electrolyte was used in it, it divides to these parts:

- 1) Polymer fuel cell or proton changing.
- 2) Alkaline fuel cell.
- 3) Acid phosphoric fuel cell.
- 4) Melted carbon fuel cell.
- 5) Solid oxide fuel cell.

The fuel cells with polymer electrolyte, because of high capacity of density (1400 watt/lit), are considered more. The electrolyte in this kind of cells is the form of plastic was made from polymer molecule. We named it as Membrane. The polymer membrane with due to electrolytes particulars that is unnormal (unusual). Because with attendance water in with be attracted by membrane, negative Ions to be kept in electrolyte structure. Only free positive ions move for transfer positive stress through the membrane

For this reason it is called as reformer membrane. Through the work of fuel cell. Electrolyte must be we

it's conductance remain. So with attendance to pressure used in fuel cells, for prevention of steam, temperature must be So 100°C. It is better to be between 60 to kept between 70- 120°C. In atmosphere pressure, the revenue temp must be lower than 70°C. Antil remain the quantity of water in normal case (position). the water transfers in two way at polymer electrolyte. One is electrical osmotic flow which transfer water and proton from anode to cathode. Another kind of transfer is, influence of water reversed. (Diffusion flux). It means water will come back from cathode to anode. So balance of water in polymer electrode deepens on how flowing electrical osmotic and in fluence of reverse water. The compositions in polymer membrane:

The electrolyte be used in this kinds of cells (proton polymer) is solid membrane made of organic substance than can change Ions. It made from sulfonic acid polymer impregnated with Fluorine or similar polymers. Among them (perfluoro carbon Fluoro carbon polymers are usually, expensive and sulfonic acid) that is sedimented on webbed condition (situation) [1] made of them need to special technology. One way to make these kinds of polymers is: fluoro carbon polymer must be To keep properties of substances through the process materials should be in extruded to thermoplastic fluoride sulfonyl. normal conditions.

The thickness of membrane made of Nafion is Polymer electrolytes area different, but in most cases they use from Nafion. 50 - 175 micron. The structure of Nafion comparatively is hard and permanent and it made from (3) three parts, three main part.

- 1) Teflon: like carbon fluorine that have hundred unit of $\text{CF}_2\text{---CF}_2$ connected to each other linear.
- 2) Transversal part of chain $\text{O---CF}_2\text{---CF}_2\text{---O---CF}_2$ that connects Teflon part to third polymer part.
- 3) Cluster Ions that consist of sulfonic acid Ions ($\text{SO}_3^- \text{H}^+$).

Particulars of polymer membrane: one particular need to membrane is thinness of membrane, when membrane became thicker, the capacity of cell be lowed (to be decreased). But thickness lower than 0.1 mm is good. Low resistance of membrane makes the increase of proton transfer capacity.

But this kind of materials have not (don't have) We can use another polymer as membrane like polystyrene sulfonate. Among suitable properties of proton interchange membrane, is lack suitable chemical resistance for long time.

of it sensitive during current and resistance connect or disconnect against separation (change to deference

The best catalyst is platinum and layer). Since low act temperature in these cells it used from catalyst in their structure. makes it easier to The porosity on electrode. [2] another precious metal, which is deposited a little on the porous carbore diffusion of reactants. For best hydrophobic polymer .platinum particles were deposited on a very thin carbon and they have spreaded effect surface for gas reactions .It is mentionable that use of a diameter about 2 nanometer and prepare Nanotechnology especially Carbon Nanotubes with direction and certain structure, is one of basic forms in properties , Fullerins and similar structures are more suitable for Nanopipes welfare of this materials in porous membranes for use. keeping hydrogen and hydrocarbons , to these cells expenses .Also carbon structures (Nanomaterials- Graphite Nanofibre and Carbonic Nanotubes) are making a Hydrogen potentiality as fuel , they can increase the efficiency of these cells and be economical more and more.

Of course in this essay we explain in detail the way of providing skilled (efficient) polymer membrane and less expense .After that we study it problems.

Polymer Electrolyte and Polymer Membrane with property of proton interchange:

- 1) Compositions used in polymer membrane.
- 2) Properties of polymer membrane.
- 3) Way to prepare the polymer membrane in lab scale.
- 4) Keeping the humid of polymer membrane.
- 5) Polymer fuel cell with Catalyst Exothermic system in cold weather.
- 6) Make of membrane _electrode fuel cell.
- 7) Way of making membrane electrode cell in lab scale.

Reference:

[1] Lehman et al, poroton exchange membrane fuel cell, U.S.pat#5, 879, 826, 1999.

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Introduction

As noted before, usually, fuel batteries are divided as per the type of electrolytes used in them and it was further noted that polymer fuel batteries are considered desirable for having many advantages such as low function temperature, non-liquidity electrolyte, corrosion