

ABSTRACT NO.: 569

TITLE: Gel Type Electrolytes for Dye Sensitized Solar Cells

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The need for alternative energy sources are becoming more crucial every day, since the depletion of fossil fuels are occurring at a rapid rate and is becoming more difficult to retrieve. The consequence of this would be an energy crisis and energy prices would elevate. Also, the problem with fossil fuels is that it can be harmful to the environment. The solution to these problems can be resolved with the use of renewable energy. This type of energy is in abundance and can be used to form electrical energy. There are many options available such as solar energy, wind energy, geothermal energy and ocean energy. Solar cell technology is the main field of solar to electrical energy conversion. The use of traditional p-n junction type solar cells have been employed but has its limitations, therefore the dye sensitized solar cells have been used due to its low cost, impurities, a high stability and efficiency. It is defined as a photo-electrochemical solar cell which consists of a photo-electrode (semiconductors), a redox electrolyte and a counter electrode which converts solar to electrical energy.

The component of the dye sensitized solar cell that is researched in this project is the gel type electrolyte. This gel type electrolyte is used because it overcomes the shortcomings such as, the leakage between conductive glass, evaporation of a liquid electrolyte and the improvement of contact between the electrolyte and titanium dioxide layers. A gel type electrolyte comprises of a salt, solvent and polymer, that is, bis(trifluoromethane) sulfon-imide lithium salt, a mixture of polypropylene and dimethylene carbonate solvent at an approximately 1:1 and polymer poly(methylmethacrylate) respectively was used in research. Assembly of this was first employed by finding the highest conductivity over a range of weight percent salt compositions at a fixed amount of propylene carbonate and dimethylene carbonate.

The optimum composition for poly(methylmethacrylate) was found and added to solution containing salt and solvent which consequently formed the gel type electrolyte.