

**Title: PVdF-graft-VIm polymer based proton exchange membranes for PEMFC applications**

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Polymer blends have been shown to possess feasible characteristics for producing a new proton exchange membrane which can replace or be used as an alternative to the currently used membranes in fuel cells like Nafion. In the present work grafting of a base functional group (vinyl imidazole) has been done on poly (vinylidene fluoride) backbone to synthesize a base polymer. The grafted method approach was chosen since it incorporates characteristics of two separate polymers into the grafted polymer. PVDF have been used because of its high mechanical strength, high melting point, and corrosion resistance where as vinylimidazole was chosen because of its alkalinity. Blends are then formed with the grafted polymer and other poly(ethylene) copolymer. Polymer electrolyte membranes have been synthesized using the blended graft polymer with superacids. The synthesized membranes have been tested for their thermal, mechanical, morphological, water uptake and electrical properties and results are discussed.