

Title: Poly (1-vinyl imidazole) Based Membranes for Fuel Cell Membrane Applications

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The invention provides new compounds having a cyclic imidazole ring structure with specialized functional groups carried on the ring in the present work which has been further utilized to generate novel membranes for fuel cell applications. Base polymer has been designed based on 1-vinyl imidazole monomer. The base monomer, 1-vinyl imidazole (VIm) is polymerized via various polymerization techniques to poly (1-vinyl imidazole). The monomer was found to polymerize readily under different conditions. The formation of the polymer is confirmed by Nuclear Magnetic Resonance (NMR) measurements. The NMR results indicated a trace polymer pattern in the peaks. The synthesized polymer has been further used to synthesize new membranes by different acid systems (small as well as large molecular weight systems). Various Electrical, thermal, morphological properties of these membranes have been studied and evaluated for their application in fuel cells. Hence, comparisons of all the results will determine the most feasible synthesis route of the poly (VIM) for its use in membranes for fuel cell applications.