

Synthesis and Characterization of Polyethersulfone(PES) Proton Exchange Membrane via ATRP

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Polyethersulfone-graft-polystyrene was successfully prepared via atom transfer radical polymerization(ATRP) catalyzed $\text{CuCl}_4/1,1,4,7,10,10$ -Hexamehtyltriethylenetetraamine (HMETA) in DMSO. ^1H NMR and FT-IR spectroscopy show that the “grafting from” method using ATRP was successful and the maximum grafting degrees were 35% PES-g-PSSA. The IEC value was 0.63 , water uptake was 46.8 w% and proton conductivite was 0.079S/cm at room temperature, for PES-g-PSSA. Membranes exhibited excellent thermal stability up to around 350 oC, verified by thermal gravimetric analysis (TGA).