

Novel Electrolytes Based on PAN Nanofibrous Membranes with PEGDME for Room Temperature Na/S Batteries

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In this study a Gel polymer electrolyte (GPE) is applied to room temperature Na/S batteries. The GPE is a polyacrylonitrile (PAN) electrospun nanofibrous membrane (ES-NFM) impregnated with 1M NaCF₃SO₃ in polyethylene glycol dimethyl ether (PEGDME, MW=500) electrolyte. The electrolyte possesses good characteristics not only ionic conductivity as good as liquid electrolytes but also mechanical strength which is comparing with those of solid polymer electrolytes (SPEs). Electrolyte uptake of PAN ES-NFM, differential scanning calorimetry (DSC), ionic conductivity, interfacial resistance and linear sweep voltammetry of the GPEs, and room temperature NaS battery Cycle test were studied in detail.