PVDF-HFP-based porous polymer electrolyte membranes for lithium-ion batteries - DTU Orbit (23/12/2018)

PVDF-HFP-based porous polymer electrolyte membranes for lithium-ion batteries
As a potential electrolyte for lithium-ion batteries, a porous polymer electrolyte membrane based on poly(vinylidenefluoride-hexafluoropropylene) (PVDF-HFP) was prepared by a phase inversion method. The casting solution, effects of the solvent and non-solvent and addition of micron scale TiO2 particles were investigated. The membranes were characterized by SEM, XRD, AC impedance, and charge/discharge tests. By using acetone as the solvent and water as the non-solvent, the prepared membranes showed good ability to absorb and retain the lithium ion containing electrolyte. Addition of micron TiO2 particles to the polymer electrolyte was found to enhance the tensile strength, electrolyte uptake, ion conductivity and the electrolyte/electrode interfacial stability of the membrane.

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