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Synthesis of nanoporous materials using block copolymers and applications as battery separators DAVID WONG, SCOTT MULLIN, GREG STONE, NITASH BALSARA, University of California, Berkeley — A method for synthesizing nanoporous battery separators using poly(styrene-b-ethylene-b-polystyrene) (SES) is presented. The polyethylene block serves as a structural component, while the polystyrene block promotes wetting of the electrolyte. The ionic conductivity of these systems swollen with 1M LiPF6/Ethylene Carbonate/Diethyl Carbonate (EC/DEC) electrolyte was measured by AC impedance. Other groups have shown that radiation induced grafting of gel polymer electrolytes can increase the conductivity of a porous PE/LiPF6/EC/DEC system by as much as an order of magnitude. Data showing the ionic conductivity as a function of void fraction of the separator are presented.

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