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High performance solid polymer electrolytes for energy storage

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Abstract

For the next generation of safe and high energy rechargeable lithium metal batteries solid polymer electrolytes (SPEs) with both high mechanical modulus and high conductivity have long been desired. In this talk, we will present a new material platform based on macromolecular nanostructured materials that provides new opportunities for the synthesis of solid polymer electrolytes with properties to levels not accessible before by conventional electrolytes. In particular, we will introduce the use of novel, stiff/glassy, nanostructured polymer particles as additives to liquid electrolytes for the synthesis of SPEs that exhibit an unprecedented combination of high modulus and ionic conductivity, at room temperature. The proposed system could open new avenues for molecular engineering of nanostructured SPEs for application in lithium metal batteries.