

Materials Panel Abstract & Speaker Biography

Evaluation of solid electrolytes for all solid state Li-S batteries

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Solid polymer electrolytes (SPEs) have been investigated as electrolyte material for the Li-S polymer cell, and are comparatively studied with the representative SPEs, Li[N(SO₂CF₃)₂] (LiTFSI)/PEO, at a molar ratio of [EO]/[Li⁺] = 20. The effects of important parameters (such as the active material content and the thickness of S cathode) on the cycling performance are presented. It has been demonstrated that conceptually novel Li-S polymer cells can deliver high specific discharge capacities of 800 mAh g⁻¹ (40 wt% S content, ≈ 50% of sulfur utilization to S²⁻), areal capacity of 0.4 mAh cm⁻² at C/5 and 0.5 mAh cm⁻² at C/10 and 70°C. The cycling performances of these Li-S cells could be significantly improved by using alternative salt compositions and/or novel polymer materials. All these, including preliminary results using garnet-PEO composite electrolytes, and together with realistic estimations of energy density made for Li-S batteries based on solid and liquid electrolytes, show the potential added advantage of solid systems for next generation batteries..

Speaker Biography:

Lide Rodriguez-Martinez is group leader of lithium based batteries and Li-S research line manager at CIC Energigune, Spain, since January 2015. Since obtaining her PhD from Cambridge in 1999, she has conducted significant research in the field of solid oxide fuel cells and batteries.

She worked 14 years in energy conversion and energy storage technology development at IK4-Ikerlan. Her main interests are the development of cutting-edge energy related concepts, such as Li-S and technology assessment toward competitive targets (performance, life, and cost).

