

Innovating the Batteries of the Future

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Lithium-ion batteries are currently driving the transition to electric mobility and the integration of renewable energies into the electric grid. In my presentation, I will provide an overview of recent advances in increasing the energy density and cycle life of next-generation lithium-ion batteries and recent efforts in reducing the environmental footprint of battery cell manufacturing and recycling [1-4].

I will then focus on recent developments and current challenges in the field of solid-state batteries. Solid-state batteries with lithium metal anodes promise to deliver an increase in energy density on cell level of up to 60% and consequently raise high expectations in the automotive and aviation industry [5-7]. We recently demonstrated a solid electrolyte based on a polymerized ionic liquid offering high ionic conductivity of almost 1 mS/cm at room temperature, low gravimetric density 1.6 g/cm³, high thermal and oxidative stability, stability vs lithium metal, soft mechanical properties, compatibility with solution processing, and potential for low cost, offering a promising pathway to a competitive solid-state battery technology [8-9].

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