

# Functional Materials Based on Ionic Liquids for Energy-Related Applications

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The conventional synthesis of functional materials relies heavily on water and organic solvents. Alternatively, the synthesis of functional materials using or in the presence of ionic liquids represents a burgeoning direction in materials chemistry. Ionic liquids are a family of non-conventional molten salts that can act as both templates and precursors to functional materials, as well as solvents. They offer many advantages, such as negligible vapor pressures, wide liquidus ranges, good thermal stability, tunable solubility of both organic and inorganic molecules, and much synthesis flexibility. The unique solvation environment of these ionic liquids provides new reaction media for controlling formation of porous materials and tailoring morphologies of advanced materials. Challenges and opportunities as well as recent advances in using ionic liquids for synthesizing functional materials including porous liquids in energy-related applications will be discussed.