

Supercritical Fluids: New Opportunities for Energy Material Synthesis and Energy Production

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Supercritical fluids can offer environmentally benign and facile synthetic conditions for the production of nanomaterials owing to their unique physical properties, including low viscosity, fast diffusion, zero surface tension, and tuneable physical properties. These factors make it a promising medium for overcoming the barriers associated with other techniques, which include the generation of toxic reaction waste, difficulty in producing nanosize materials, and transport limitations. This talk will discuss various energy material synthesis and energy production using supercritical fluids. The energy material section will cover lithium iron phosphate (LiFePO₄), lithium titanium oxide (Li₄Ti₅O₁₂), and graphene synthesis in supercritical water or in supercritical alcohol for lithium 2nd battery applications. The second part, the energy process section, will discuss current studies of hydrogen production in supercritical water, biooil production, and 2nd generation biodiesel production using supercritical fluids.