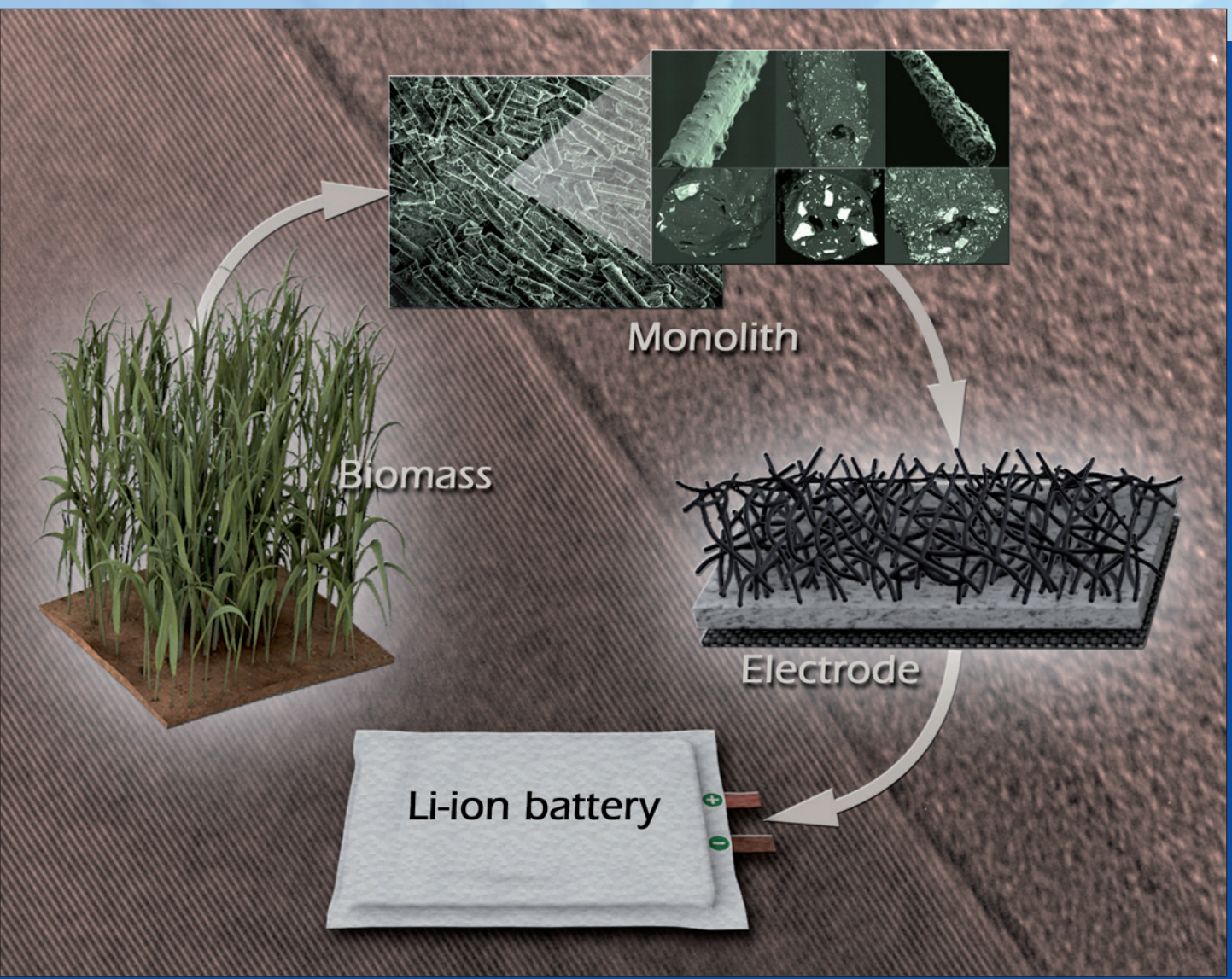
Energy Technology

Generation, Conversion, Storage, Distribution

9-10/2014



Cover Picture: Carbon fibers are derived from lignin and incorporated with silicon nanoparticles to fabricate unique electrode architectures for high-capacity lithium-ion batteries (O. Rios)

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Cover Picture

Orlando Rios*, Surendra K. Martha, Michael A. McGuire, Wyatt Tenhaeff, Karren More, Claus Daniel, and Jagjit Nanda

Lignin–silicon electrodes—The best of both worlds: The cover image highlights a method that combines lignin-derived carbon fibers with silicon nanoparticles to form novel electrodes for high-capacity lithium-ion batteries. Silicon is viewed as an attractive anode material because of its high theoretical capacity, but when used in bulk or film forms, silicon suffers from mechanical degradation and loss of electrical conductivity during battery cycling. The Communication by Orlando Rios and colleagues at Oak Ridge National Laboratory and the Indian Institute of Technology on page 773 introduces a direct manufacturing process to encapsulate the active silicon particles within melt-spun carbon fibers made from lignin. The new low-cost composite material exhibits nearly twice the capacity of graphitic carbon commonly used in lithium-ion batteries.