



Optical and Mechanical Properties of Nanocomposite Films Consist of Polymethyl Methacrylate and Silica Nanoparticles Using Ultrasonic Spray Deposition

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Abstract:

In this study, ultrasonic spray deposition (USD) technology was used to prepare nano-composite polymer electrolyte films with polymethyl methacrylate (PMMA) as the matrix, dimethyl carbonate (DMC) as the solvent, and silicon dioxide as the second phase. The annealing procedure improves the uniformity and transmission of the film. Due to the aggregation of fumed silica nanoparticles, the addition of silica reduced the permeability of the electrolyte membrane. However, the addition of the surfactant cetyltrimethylammonium bromide (CTAB) dispersed the nanometer silica particles and returned the optical transmittance of the nanocomposite polymer electrolyte membrane to about 90%. Our nanocomposite polymer electrolyte membranes have better hardness and elastic modulus than commercial materials.

Biography:

Chi-Ping Li has completed his PhD of Materials Science from Colorado School of Mines and followed by postdoctoral studies in National Renewable Energy Laboratory (NREL) in USA. He is a assistant professor of Chemical Engineering Department in National United University in Taiwan. His research interests are mainly focused on synthesis of nanostructured films, nanocomposite films and nanoparticles. Those materials are used in electrochromic windows, lithium batteries, photovoltaics and LED encapsulants. His goal is to overcome the challenges in the field of green and renewable energy and produce great but low cost materials.

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