

Electrospun Poly(Glycidyl Methacrylate)-based Crown Ether Nanofibers as Lithium Ion Adsorbents

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Electrospun synthesized poly(glycidyl methacrylate)-based 14-membered crown ether (PGMA-CE) nanofibers were prepared, characterized (SEM-EDS, capillary flow porometer, UTM, NMR, FTIR, TGA and elemental analysis) and tested for lithium ion (Li⁺) adsorption. Herein, hydroxy-dibenzo-14-crown-4 ether (HDB14C4) and hydroxy-tetraethyl-14-crown-4 ether (HTE14C4) were independently attached on glycidyl methacrylate (GMA) monomers via epoxide ring opening to obtain GMA-HDB14C4 and GMA-HTE14C4, respectively. These compounds were etherified with proton ionizable COOH groups to produce GMA-HDB14C4-COOH and GMA-HTE14C4-COOH, respectively. The GMA-CEs were polymerized to synthesize CE-containing polymers or PGMA-based CEs, with or without COOH groups. The PGMA-CEs were electrospun to produce the PGMA-CE nanofiber adsorbents. This work was supported by the Basic Science Research Program through the National Research Foundation of Korea (NRF) grant funded by the Ministry of Education (No. 2009-0093816).