

Polymeric nanofibers supported crown ethers with bulky and rigid subunits as lithium adsorbents prepared via electro-spinning and novel aerosol method

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Bis-epoxide cyclization with 1,2-dihydroxybenzene to synthesize di-hydroxy lithium selective 14-membered crown ether (CE) with rigid and bulky subunits was reported. CE-PVA nanofibers were prepared via electro-spinning and acetalization using aerosol method. CE structures and immobilization were confirmed by <sup>1</sup>H, <sup>13</sup>C NMR, FTIR, and TGA. Surface and mechanical analyses were done. Adsorption experiments show superior lithium uptake and selectivity among previously reported solid-supported CEs. This can be attributed to appropriate choice of polymer support which has: suitable functionalities for successful CE immobilization, hydrophilicity for promotion of CE-lithium complexation, and high CE loading capacity. This work was supported by NRF grant by the Ministry of Education (No. 2009-0093816).