

Polyvinyl alcohol (PVA) with lithium ion sieves (LIS): A novel reusable lithium adsorbent foam prepared via cryo-desiccation and chemical cross-linking

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Composite polyvinyl alcohol (PVA) with H1.6Mn1.6O4 (HMO) foams were produced via cryo-desiccation method as lithium (Li<sup>+</sup>) adsorbents. SEM-EDS and FE-EPMA revealed homogenous HMO distribution in the 3D network of the foam. Hydrophilicity of the PVA-HMO foams facilitated good contact between the Li<sup>+</sup> solution and the adsorbents, minimizing Li<sup>+</sup> adsorption loss of the foams relative to the HMO powder. Adsorption performance improved at high HMO loading of 250%. Further increase in loading (300%) resulted in poor mechanical stability. In a simulated seawater, PVA-HMO foam preferentially adsorbed Li<sup>+</sup> over other cations. This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Ministry of Science, ICT & Future Planning (No. 2012R1A2A1A01009683) and the Ministry of Education (No. 2009-0093816).