

Lithium Adsorption and Selectivity Studies using Crown Ether-functionalized Magnetic Graphene Oxide

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A composite adsorbent (CE-GO-Fe₃O₄) was synthesized and used as lithium ion (Li⁺) adsorbent. The composite is composed of a crown ether (CE) as Li⁺-specific ionophore, magnetite (Fe₃O₄) for its easy separation and recyclability, and graphene oxide (GO) as support of the CE and Fe₃O₄. The adsorption experiment was conducted at varied Li⁺ concentrations. Results reveal the Langmuir-type Li⁺ uptake of the CE-GO-Fe₃O₄. The adsorbent was highly selective towards Li⁺ as compared to other cations such as Na⁺, K⁺, Mg²⁺, Ca²⁺ and Sr²⁺. It can be easily separated via external magnet and re-used. Overall results demonstrate the suitability of CE-GO-Fe₃O₄ for long-term Li⁺ adsorption application. This work was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Science, ICT and Future Planning (2015R1A2A1A15055407) and by the Ministry of Education (No. 2009-0093816).