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Green recovery of lithium from seawater by hydrophobic interaction of poly(*N*-isopropylacrylamide)/alginate composite[1] SUNG HO PARK, SANG JOON LEE, Pohang Univ of Sci Tech — The demand of lithium, which is known as a crucial strategic element, has been largely increased in various applications, including lithium ion batteries. Herein, we propose the technique in a green recovery of Li^+ ions from seawater. Poly(*N*-isopropylacrylamide)(PNIPAAm)/alginate(Alg) composite crosslinked with Al^{3+} ions selectively adsorbs Li^+ ions from seawater. Strong repulsion force by Al^{3+} ions rejects cations with a high adsorption affinity, while less rejecting Li^+ ions with a low adsorption affinity. Structural characteristics of PNIPAAm/Alg composite were analyzed by using *in situ* TEM and *in situ* FTIR techniques. PNIPAAm/Alg composite is rapidly hydrated within 60 min, which enables rapid adsorption of Li^+ ions. In addition, the incorporation of thermoresponsive PNIPAAm polymer induces a green recovery of Li^+ ions by a hydrophobic interaction with applying a small thermal energy without the acidic treatment. 7.3% of Li^+ ions can be recovered from Li^+-spiked seawater containing an extremely high concentration of impurities. The present study will provide an efficient Li^+ recovery method with a novel interaction between ions and polymeric network.

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Sung Ho Park
Pohang Univ of Sci
Tech

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