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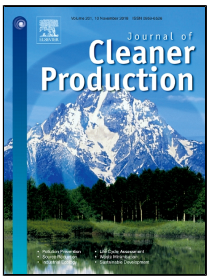

An efficient lithium ion imprinted adsorbent using multi-wall carbon nanotubes as support to recover lithium from water

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An efficient lithium ion imprinted adsorbent using multi-wall carbon nanotubes as support to recover lithium from water

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ABSTRACT: With the extensive applications of lithium ion batteries, the exploitation and recycle of lithium resources is essential for the manufacture of lithium ion batteries. This work reports that novel lithium ion imprinted polymers (LIPs) loaded on the surface of multi-wall carbon nanotubes (MWCNTs) were prepared by surface imprinting polymerization. The performance of the prepared LIPs was analyzed by UV-vis recording spectrophotometry, ICP-AES, FT-IR and SEM. The maximum adsorption capacity of the 15 mg LIPs was calculated to be 1362.56 μmol/g at a 300 mg/L Li^+ solution. In the presence of Na^+, K^+, Cu^{2+} and Zn^{2+}, the selectivity factors of the LIPs for Li^+ were 3.66, 3.01, 2.05 and 2.10, respectively, suggesting that the LIPs had ideal selectivity for Li^+. In addition, the experimental data can be described well by the pseudo-first-order and Langmuir adsorption isotherm models. The regeneration of the LIPs was performed by being eluted with 1 M nitric acid, and the adsorption capacity of the regenerated LIPs only decreased about 10.3% after ten cycle experiments.