

One-step process for purification of lithium chloride to battery grade

Dženita Avdibegović^{†*}, Viet Tu Nguyen[†], Koen Binnemans[†]

[†]KU Leuven, Department of Chemistry, Celestijnenlaan 200F, P.O. box 2404, B-3001 Leuven, Belgium.

*Presenting author

Abstract

Lithium is a crucial raw material for lithium-ion batteries, where it is used as a constituent of the electrolyte and electrode materials. The required purity of lithium compounds used for the production of battery components is very high (>99.5%). In this work, a process that exploits the differences in solubility between LiCl and other alkali and alkaline earth chlorides and hydroxides in ethanolic solutions has been investigated for the purification of LiCl to a battery-grade at room-temperature. High-purity LiCl (>99.5% Li) was prepared in a single processing step comprising the simultaneous selective dissolution of LiCl and precipitation of Mg(OH)₂ and Ca(OH)₂ with LiOH·H₂O in 95 vol.% ethanol. The similar process in aqueous solution, however, resulted in impure LiCl product (e.g. <76.5%). A closed-loop flowsheet based on the green solvent ethanol is proposed for purification of LiCl, a precursor for battery-grade LiOH·H₂O.