Liquid-Liquid Extraction of Lithium using Lipophilic Dibenzo-14-Crown-4 Ether Carboxylic Acid in Room Temperature Ionic Liquid

Torrejos Rey Eliseo, Nisola Grace, Parohinog Khino, Lee Seong Poong, Seo Jeong Gil, Koo Sanghoo, 정욱진†

Department of Energy Science and Technology (DEST), Energy and Environment Fusion Technology Center (E2FTC), Myongji University

(wjc0828@gmail.com†)

Hydroxy-14-Crown-4 ether was functionalized with long alkyl chain and a carboxylic acid functional group by series of oxidation and etherification coupling reactions. The long alkyl chain provides lipophilicity and enhanced solubility in the organic RTIL phase while the carboxylic acid functional group provides the mechanism for transport of lithium ions towards the organic phase via ion exchange. The effect of crown ether loading, pH and thermodynamic extraction properties was investigated for optimum lithium extraction. Selectivity towards lithium in the presence of competing metal ions was also investigated. 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).