Analysis on Extraction Behaviour of Lithium-ion Battery Electrolyte Solvents in Supercritical CO₂ by Gas Chromatography

Yuanlong Liu¹, Deying Mu¹, Yunkun Dai², Quanxin Ma¹, Rujuan Zheng¹, Changsong Dai^{1,*}

¹ MIIT Key Laboratory of Critical Materials Technology for New Energy Conversion and Storage, School of Chemistry and Chemical Engineering, Harbin Institute of Technology, Harbin 150001, P.R. China

² College of Animal Science and Veterinary Medicine, Jilin University, Changchun 130062, P.R. China

*E-mail: changsd@hit.edu.cn

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The extraction behavior of Lithium-ion battery electrolyte components has been investigated in diverse parameters for supercritical CO₂. The components, containing ethylene carbonate, dimethyl carbonate and ethylmethyl carbonate that are commonly used in lithium ion battery electrolyte, have been quantitated by gas chromatography with flame ionization detector based on internal standard calibration. The extraction behavior, yield and order of extract components have shown the difference caused by the varied physical properties under selected extraction parameters--extraction pressure (15 to 35 MPa), temperature (30 to 50 °C) and time (25 to 65 min). In addition, the polarity and the melting point of carbonate has a strong influence on composition during the trapping process.

Keywords: Carbonate-based electrolyte, Extraction behavior, Supercritical CO₂.

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