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Electrochemical Characteristics of Polymer Electrolyte based on Microporous PVC/PMMA blend 미세다공성 PVC/PMMA 블렌드를 기초로 한 고분자 전해질의 전기화학적 특성

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The electrochemical properties of the polymer electrolytes based on poly(vinyl chloride)/poly(methyl methacrylate) blend with micropore structure have been investigated. The introduction of poly(methyl methacrylate)(PMMA) into poly(vinyl chloride)(PVC) matrix enhanced compatibility between the polymer matrix and the liquid electrolyte(EC/DMC/LiClO₄). The polymer matrix with micropore structure was obtained by extracting DBP from the polymer film containing silica and the polymer electrolytes were prepared by dipping the polymer matrix into the liquid electrolyte. The addition of silica into the polymer blend generated micropore structure in the polymer matrix and increased the uptake amount of the liquid electrolyte. The ion conductivity of the polymer electrolyte was increased with the increase in the PMMA content in the blend and the room temperature ion conductivity of the polymer electrolyte based on PVC/PMMA(5/5,w/w) blend was 1.9×10^{-3} S/cm. The leakage of the liquid electrolyte from the polymer matrix was suppressed with the increase in the PMMA content in the polymer electrolyte due to the good compatibility of the polymer matrix with liquid electrolyte. The charge-discharge behavior of the unit cell was also investigated.