

## Electrochemical Assessment of the Lithium-Ion Battery Electrolytes

리튬 이온 전지용 전해액의 전기화학적 안정성 평가

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The assessment of lithium-ion battery (LIB) electrolytes usually begins with determining their electrochemical stability windows. Non-active material electrodes such as Pt, Au, and glassy carbon have been used in electrochemical characterization of LIB electrolytes for a long time. It is the fact that non-active electrodes such as Pt, Au, and glassy carbon fail to serve as the complete model for the cathode and anode of the practical LIBs. Despite this inherent limit, it seems that non-active electrodes will continue to play their typical role in the R&D of LIB electrolytes, because experimental procedure is easy to perform and the obtained data is simple to understand. Indeed, there seems to be wide agreement on the fact that non-active electrodes is the quite decent choice for determining the oxidation stability of LIB electrolytes. On the other hand, measuring the reduction stability is complicated partly due to various side reactions and also due to material dependence of the reduction reactions. This study reports some recent activities regarding evaluation of the electrochemical stability of the LIB electrolytes. First, oxidation reactions of LIB electrolytes on Pt electrodes are investigated with the cyclic voltammetry and rotating ring disk electrode (RRDE) technique. Secondly, reduction reactions of several solvents and additives on graphite electrodes used in practical LIBs are compared using slow scan cyclic voltammetry and charge/discharge cycling.