Symp B2

Cycling Performances of the Li/V_2O_5 Polymer Cells Prepared with Gel-Coated Separator

겔 코팅된 세퍼레이터를 이용한 Li/V_2O_5 폴리머 전지의 싸이클 특성

윤형준 · 김은선 · 정연복 · 김동원

한밭대학교 응용화학과

Rechargeable lithium battery using lithium metal as an anode is the most attractive candidate for high energy density power sources for portable electronic devices, electric vehicles and load leveling systems. The major problem that prevents the lithium metal battery to achieve a comparable success is the risk associated with the reactivity of lithium metal that can affect cycle life of the battery and its safety. In order to solve this problem, polymer electrolyte has been introduced as a novel electrolyte material in the field of lithium metal batteries. The concept is to stabilize the lithium electrode interface by the use of dry solid polymer electrolyte or gel polymer electrolyte. We previously reported the electrochemical characteristics of gel polymer electrolyte prepared with the polymer-coated separator as en electrolyte material for rechargeable lithium batteries [1,2]. Such membrane-supported gel polymer electrolytes showed excellent mechanical strength for the fabrication of batteries and could therefore help in reducing the overall thickness of the electrolyte layer when compared to conventional gel polymer electrolytes. Gel polymer formed on both sides of the separator could also assist in adhering the electrodes to the separator. In this study, we report cycling performances of lithium metal polymer cells composed of a metallic lithium anode, gel-coated separator as an electrolyte and a vanadium pentoxide(V_2O_5) cathode. In the cells, vanadium pentoxide was used as a cathode, because it is well known that it is easy to synthesize, has acceptable production costs and exhibits large lithium insertion capacity [5]. On the basis of the interfacial characteristics between lithium anode and gel polymer electrolyte, the electrochemical performance of Li/V_2O_5 polymer cell will be discussed.

References

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