

Enhanced Electrochemical Properties Of ICP/LiMn₂O₄ Composite Cathodes For Lithium Secondary Batteries

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Commercial lithium ion batteries are still using the LiCoO₂/C redox system, firstly introduced and commercialized by Sony in 1990 [1]. However, because of its high cost and environmental disadvantage, the high voltage intercalation compound (LiMn₂O₄) was proposed as a potential alternative to LiCoO₂. Unfortunately LiMn₂O₄ has been proven to have poor cycle performance through many experimental report [2]. Therefore, we introduced conducting polymers/LiMn₂O₄ hybrid system as a cathode material for lithium ion batteries.

ICPs were chemically synthesized onto LiMn₂O₄ in aqueous solution and the various amounts of ICPs were deposited onto LiMn₂O₄ surface. (fig.1) Charge and discharge tests on ICP/LiMn₂O₄ hybrid electrodes were conducted at potential ranging between 4.2V and 3.0V vs. Li/Li⁺. Intrinsically conducting polymers (ICPs) played key roles on stabilizing the structure with enhanced capacity of composite electrodes.

Their effects on charge/discharge current densities will be investigated. Electrochemical voltage spectroscopy(EVS) was used to study reversibility of this composite.

References

1. T.Nagaura, K.Tazawa, *Prog. Batteries Sol.Cell*, **9** **20**(1990)
2. M.Broussely, P.Biensan, B.Simon, *Electrochimica Acta*, **45** 3-22(1999)

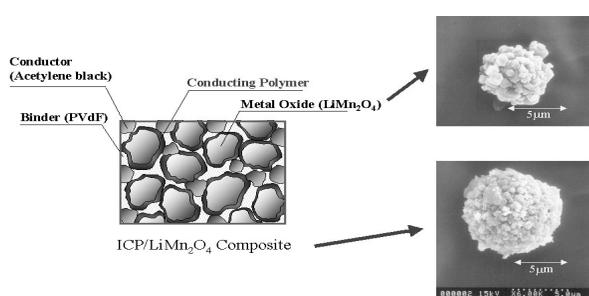


Fig. 1. Conducting polymer/LiMn₂O₄ composite has effective conducting network.