The study on the electrochemical characteristics of cell fabricated by screen printed $LiMn_2O_4$ cathode and thermal evaporated LiAl anode with polymer electrolyte

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Recently. Thin film rechargeable batteries have received significant attention due to their broad applications such as micro-sensors, smart cards, and micro-electro-mechanical system (MEMS) devices. The energy storage capacity is in general dependent on cathode materials. It is well-known that the transition metal oxides, such as $LiCoO_2$, $LiMn_2O_4$, $LiNiO_2$ have been extensively studied due to their high voltages close to 4 V and long cycle life.

Usual thin film battery is hard to make enough capacity and to get enough thickness. The screen printing method solved these problems. This method makes enough thick $LiMn_2O_4$. So, it is possible to obtain enough capacity.

And Li metal has the lowest potential in the world and has very large theoretical capacity. However, there are many problems ; it is very dangerous, as the activity is very high and the growth of dendrite make short of cell during cycling. To solve these problems, LiAl anode is suggested. The LiAl anode is fabricated by thermal evaporation of Li metal on the Al foil in vacuum condition.

Polymer electrolyte also contributes the stability of cell and has the advantages of solid electrolyte.

In this study, rechargeable Li polymer batteries were fabricated using screen printed $LiMn_2O_4$ cathode and thermal evaporated LiAl anode. From the analysis of the cycling property of the cell and AC impedance spectra, the possibility of the application of screen printing method and the fabrication of LiAl anode by thermal evaporation are proposed.