박막전지용 Si/Mo 다층박막 음극의 전기화학적 특성
Characterization of Si/Mo Multilayer Anode for Microbattery

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The adventages of Li alloys have attracted the attention of many research groups, many of which have investigated tin-based alloys [1-2]. Despite interesting performances of these, the irreversible capacity loss systematically observed on the first cycle for these compounds is a main drawback for their use as anode materials in lithium ion cells. Not only Sn is efficient in forming alloys with Li, Si can also react with Li to form alloys with a high Li/Si ratio, like $Li_{22}Si_5$ at 400℃. It corresponds to a capacity of 4200mAh/g. Electrochemical Li-Si reaction occurs between 0 and 0.3 V against Li/Li^+, so that high-energy density battery can be realized. Despite the high theoretical capacity of elements like Si, however, particles of the alloys crack and fragment due to the repeated alloying and de-alloying which occurs as cell are charged and discharged. The research groups of Huggins [3] and Besenhard [4] have proposed that the volume expansion due to the insertion of Li can be reduced in micro- and submicro-structured matrix alloys. For this reason, the research group of J.R. Dahn investigated Sn/Mo sequential sputter deposition to prepare nanocomposites [5].

In this study, we investigated the characterization and the electrochemical characteristics of sequentially sputtered Si/Mo multilayer for microbattery anode.

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