

BFA5

Study on The Factors Affecting Electrochemical Reaction of Rechargeable Lithium Sulfur Battery

리튬 설퍼 이차전지의 전기화학 반응에 영향을 미치는
인자들에 관한 연구

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The high capacity and rechargeability of sulfur are achieved from the electrochemical cleavage and reformation of sulfur-sulfur bond in cathode, which accompany a phase change of polysulfide together with a morphological change of the cathode. However, understanding on these changes during the repeated charging and discharging of the sulfur battery has been limited due to the incomplete characterization of the redox products.

In this work, we have tried to get more understanding on the changes of cathode during the cycles and the major factors affecting performance of Li/S battery by means of SEM and WDS techniques.

The relative amount of solid sulfur compound in the cathode was quantitatively measured by WDS. The sulfur content was abruptly decreased at the early stage of discharge and then increased with the increase of the depth of discharge. During the charging, the sulfur content was slightly increased. The solid sulfur compound formed at the end of charging and discharging process was found to be a lithium sulfide. These lithium sulfides were formed around carbon matrix and behaved as the blockage of ionic diffusion, which results in the decrease of reaction sites of polysulfide. The lithium sulfide content was found to be increased with the increase of cycle number, indicating the increased passivation.