

Study of Atomic and Electronic Structures of Cobalt Disulfide/Carbon Nanotube by X-ray Absorption Spectroscopy

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Cobalt disulfide/carbon nanotube composites were prepared with different weight ratios as catalyst for electrochemical energy storage application. The crystal structures and morphologies of the synthetic samples were characterized by XRD and SEM, respectively. Electrochemical measurements were conducted to study the redox properties and Raman spectroscopy was used to determine the molecular interactions. Moreover, the local atomic and electronic structures of these cobalt disulfide/carbon nanotube composites were investigated by ex situ x-ray absorption spectroscopy, including x-ray absorption near edge structure with extended x-ray absorption fine structure. The analytical x-ray spectroscopic results reveal the cause of different electrochemical properties of these cobalt disulfide/carbon nanotube composites.