

X-Ray diffraction and X-Ray absorption spectroscopy studies on Lithium battery materials

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X-Ray diffraction (XRD) and X-ray absorption spectroscopy (XAS) techniques are used to examine the lattice parameters, oxidation state, electronic and local structure of the lithium battery electrode materials. I will present our group research results on XRD and XAS studies on bare and Ru, Co, Cr, Al doped LiMn_2O_4 , layered Ni, Mn doped LiCoO_2 , CoN and V-edge, LiVPO_4F , V_2O_5 and LiV_3O_8 and metal cluster compounds ex: $\text{Mn}_2\text{Mo}_3\text{O}_8$, LiYMo_3O_8 . The above compounds were prepared by using the following methods: molten salt method, Polymer precursor method, Carbothermal reduction method, co-precipitation method, followed by solid state reaction and ammonolysis method. Materials were well characterized by wide variety of physical and electroanalytical techniques.

Key words: X-Ray absorption fine structure; Electronic structure; Rietveld refinement XRD; Lithium batteries.