

Electrochemical Behavior of Gallium-Doped Lithium Titanate in a Wide Range of Potentials

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A synthesis method of gallium-doped lithium titanate is proposed. The effect of gallium-doping on electrochemical properties of the $\text{Li}_{4+x-3y}\text{Ti}_{5-x}\text{Ga}_{x+y}\text{O}_{12}$ ($x+y = 0.2$; $y/x=2.56$) is studied in detail. It has been established that the cycling range extension leads to a reversible insertion of more than four lithium ions per formula unit of gallium-doped lithium titanate, which corresponds to a reversible capacity of about 280 mAh g^{-1} . Gallium doping results in the increased cycling stability of lithium titanate in a wide range of potentials. The good electrochemical performance of the gallium-doped lithium titanate can be attributed to the increase in conductivity and effective diffusion coefficient.

Keywords: Gallium doping, lithium titanate, wide potential range, lithium-ion battery

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