

SIZE EFFECTS IN $\text{Li}_{4+x}\text{Ti}_5\text{O}_{12}$ SPINEL

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In this work we report enhanced Li storage in nano sized $\text{Li}_4\text{Ti}_5\text{O}_{12}$ spinel. The near surface environment of the nano sized particles allows easier accommodation of Li, leading to a larger storage capacity and also explaining the curved nature of the equilibrium cell voltage. At low voltages the increasing lithium storage within the surface layer triggers an opposing mechanism leading to irreversible capacity loss, most likely due to surface reconstruction. Such mechanism rationalizes the existence of an optimal particle size. The general nature of these results suggests similar surface storage effects and an optimal particle size in terms of Li storage to exist for transition metal oxides electrode in general.