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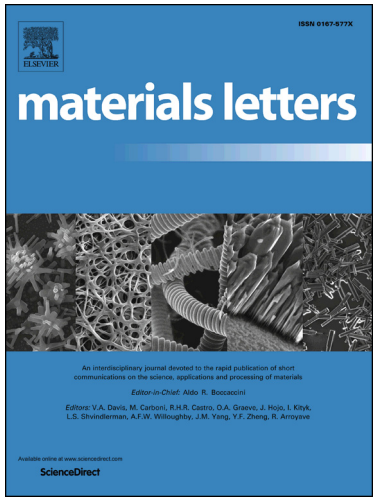

Ultrafast synthesis of $Mn_{0.8}Co_{0.2}CO_3$/graphene composite as anode material by microwave solvothermal strategy with enhanced Li storage properties

Qinqin Xiong, Jingjing Lou, Yujia Zhou, Shaojun Shi, Zhenguo Ji

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Ultrafast synthesis of $Mn_{0.8}Co_{0.2}CO_3$/graphene composite as anode material by microwave solvothermal strategy with enhanced Li storage properties

Qinqin Xiong[a], Jingjing Lou[a], Yujia Zhou[b], Shaojun Shi[b*], Zhenguo Ji[a*]

a College of Materials and Environmental Engineering, Hangzhou Dianzi University, Hangzhou 310018, People's Republic of China

b Jiangsu Lab of Advanced Functional Material, Changshu Institute of Technology, Changshu, 215500, China

Abstract

Carbonate is recently studied as anode material for lithium ion battery due to its relatively high capacity compared to relative oxides. In order to improve the time-efficiency of synthesis, an ultrafast solvothermal process assisted with microwave is carried out to obtain well-constructed $Mn_{0.8}Co_{0.2}CO_3$/graphene composite as anode material for lithium ion batteries. The as-prepared $Mn_{0.8}Co_{0.2}CO_3$/graphene composite with a graphene amount of 17.5 wt.% exhibits a morphology of cubic particles in graphene without any impurity. $Mn_{0.8}Co_{0.2}CO_3$/graphene delivers high initial charge capacities of 1033 mAh g^{-1}. And after 120 cycles, charge/discharge capacities of 737/735 mAh g^{-1} are maintained at 0.2 A g^{-1}. Even at 2 A g^{-1}, the composite can still deliver high charge/discharge capacities of 500/501 mAh g^{-1}. It is promising to obtain carbonate/graphene anode materials rapidly through such ultrafast solvothermal process assisted by microwave for application.

Keywords: Ultrafast synthesis; Solvothermal; Carbon materials; Composite materials; Energy storage and conversion; Lithium-ion battery.

* Corresponding author: Tel.: +86 512 52251895; fax: +86 512 52251895.
E-mail address: ssj0275@cslg.edu.cn (S.J. Shi).
* Corresponding author: Tel.: +86 571 87713535.
E-mail address: jizg@hdu.edu.cn (Z.G. Ji).