

Synthesis and electrochemical properties of Co_3O_4 nanocubes

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Cobalt oxide (Co_3O_4) nanocubes with perfect shape were successfully synthesized by simple, low cost, effective hydrothermal technique. The synthesized Co_3O_4 were characterized by X-ray diffraction (XRD), UV-vis spectroscopy, scanning electron microscopy (SEM), transmission electron microscopy (TEM) and energy dispersive X-ray spectroscopy (EDX). Herein, the calcination temperature of Co_3O_4 avoided the agglomeration of and protected the integrity of perfect crystal form to the maximum extent. The morphological studies showed highly uniform and well defined Co_3O_4 nanocubes with the width of several ten nanometers to several hundred nanometers. The X-rays analysis examined the phase purity and crystallographic structures of the synthesized Co_3O_4 nanocubes. The structural characterizations confirm the formation of Co_3O_4 nanocubes without displaying any other oxide forms. On the basis of synthesis, possible aggregate-dissolution-recrystallization growth mechanism was proposed to explain the formation process of the Co_3O_4 nanocubes.