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(57) Abstract :
We have successfully synthesized large scale magnesium cobalt oxide (MgCo2O4) nanosheets (NSs) was synthesized by a facile hydrothermal route. These MgCo2O4 NSs were characterized by X-ray diffractometry, N2 adsorption Brunauer-Emmett-Teller method, scanning electron microscopy and transmission electron microscopy analysis. XRD and TEM results suggest that MgCo2O4 was cubic structure with nano sheets and sizes in the range of 200–250 nm diameter and 10–15 nm thickness. The N2 adsorption–desorption analysis indicates that the BET surface area of MgCo2O4 nanoparticles is calculated to be 98.5m2/g and the pore size distribution is mostly centered at 30 nm. The MgCo2O4 sensor was exposed two type of reducing gases like ethanol and acetone and the results demonstrates that the sensor showed superior gas sensing performance such as high sensitivity(81×10−3 k/Pa), rapid response (15 s) and recovery time (19 s) towards ethanol gas. This could be due to large specific surface area with sufficient sensing active sites, more gas adsorption, and achieving the enhanced gas sensing performance. The improved gas sensing mechanism of the proposed sensor is also discussed in detail.

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