

Reduced Graphene Oxide Assisted the Nanorod Growth of Zinc Oxide by Laser Sintering

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Abstract (Arial 10)

The shapes of reduced graphene oxide (RGO)/ zinc oxide (ZnO) composite can be changed from the nanoparticle/nanoparticle to the nanoparticle/nanorod, and interlinked with RGO by the laser sintering. The results demonstrated the RGO assists the nanorod growth of ZnO. In this paper, the particle-like RGO/ZnO composite powder is manufactured by the sol-gel method, and then is sintered by laser. Subsequently, the nanorod-like ZnO is formed and interlinked with particle-like RGO. Fig. 1 shows the XRD diffraction spectra of the graphite, the graphite oxide (GO), and the RGO/ZnO. This demonstrated the structure of the graphite and GO are fractured and reduced the peaks of RGO in the process. The composite powder is then scanned and sintered to a solid film by a laser. The solid transformation is investigated. Fig. 2(a) shows that the structure of the ZnO retains the particle-like shape after the laser sintering. Fig. 2(b) shows that the structure of GRO/ZnO after the laser sintering. The nanorod-like shape of the ZnO is interlinked with RGO. The comparisons of Fig. 2(a) and Fig. 2(b) demonstrates that the RGO assists the nanorod growth of ZnO. The unique structure is characterized by a field-emission scanning electron microscope (FE-SEM), an X-ray diffraction analyzer (XRD), an energy dispersive spectroscopy (EDS), and a Raman spectroscopy.

References

[1] Kanika Anand, Onker Singh, Manmeet Pal Singh, Jasmeet Kaur, Ravi Chand Singh, Sensors and Actuators B, 195 (2014) 409-415.

[2] Ya-Li Chen, Chun-E Zhang, Chao Deng, Peng Fei, Ming Zhong, Bi-Tao Su, Chinese Chemical Letters, 24 (2013) 518-520.

Figures

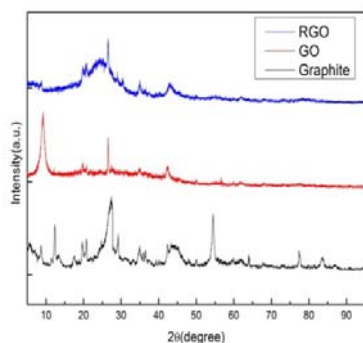
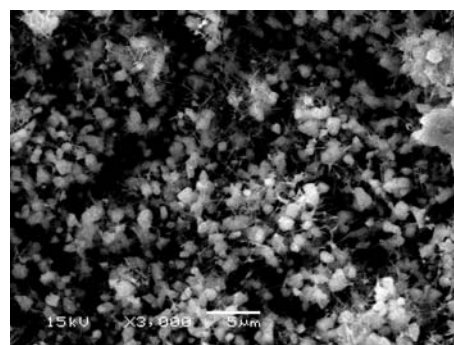


Fig. 1 The XRD diffraction spectra of graphite, graphite oxide (GO), and RGO.

(a)



(b)

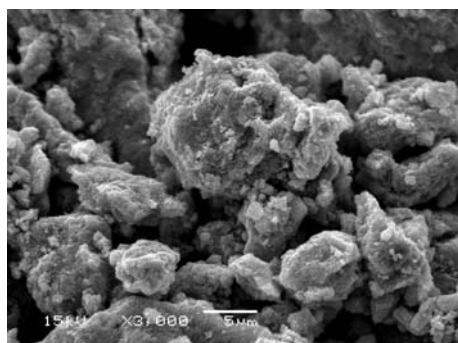


Fig. 2 (a) the structure of the ZnO retains the particle-like shape after the laser sintering; (b)

This structure of GRO/ZnO after the laser sintering. The nanorod-like shape of the ZnO is interlinked with RGO.