

Synthesis, Characterization and Application of WS₂ nanostructures in Gas Sensing

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WS₂ is one of the most promising 2-D materials for gas sensing applications after graphene [1]. In the current study, WS₂ nanostructures were synthesized by a simple and relatively low temperature colloidal route in the presence of oleylamine (OLA). The formation of nanosheets was found to be a function of time from nanoflakes to nanosheets (fig. 1). The diffraction pattern showed prominence of the (002) peak suggesting the existence of multi-layered nanosheets (fig. 2). The nanostructures displayed an n-type behavior towards certain polar and non-polar chemical vapors.

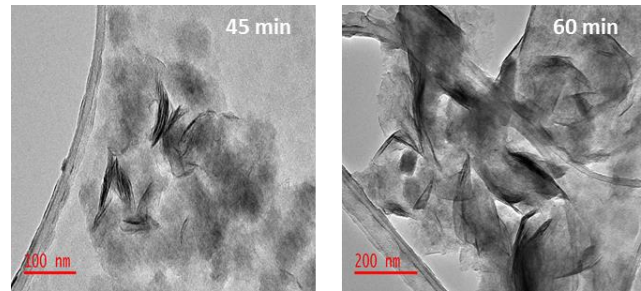


Figure 2. Typical TEM images of WS₂ nanostructures at different reaction time intervals

Reference

- [1] Kim J.; Byun, S.; Smith, A. J.; Yu, J.; Huang, J., J. Phys. Chem. Lett., 4 (2013) 1227–1232

Figures

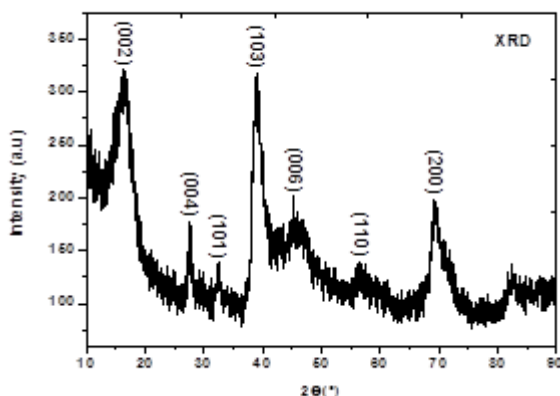


Figure 1. Typical XRD pattern of WS₂ nanosheets