High-sensitivity SO₂ Gas Sensor Based on Noble Metal Doped WO₃ Nanomaterials

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In this paper, the WO₃ nanoparticles(NPs) were prepared by a facile and low cost chemical coprecipitation method. Then the Pt-WO₃ and Au-WO₃ were synthesized. The morphologies of the samples were represented by XRD and SEM. Sensing characteristics of novel metal doped WO₃ sensors were investigated by exposure to SO₂ gas at different operating temperature. The sensor response for SO₂ gas was measured with different concentrations from 100 ppb to 16 ppm. As a result, the 1 wt%Pt-WO₃ sensor presented a greatly low detection limit of 100 ppb at optimum operating temperature of 160 °C. The sensitivity of 1 wt%Pt-WO₃ sensor for 100 ppb reached 4.1. As well as a better sensor response as compared to the other SO₂ gas sensor. It demonstrated that the Pt-WO₃ materials may be used to develop the commercial SO₂ gas sensor.

Keywords: SO₂, WO₃ nanoparticles, coprecipitation, Sensing characteristics

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