

Effect of NiO addition on the DPGME sensing properties of SnO₂ thin film

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A SnO₂-based thin film (S_TN) and thick film (S_TK) sensors prepared by ion sputtering and screen printing methods, respectively, to investigate sensing behaviors of S_TN and S_TK sensor for the detection of 0.1 ppm DPGME. The S_TK sensor shows a particle size of 30 to 200 nm and a thickness of 10 μm. While, the particle size and thickness of S_TN sensor were about 60 nm and 100 nm, respectively. The S_TK sensor showed a low sensor response of about 29 % for the detection of 0.1 ppm at 350°C, while the S_TN sensor showed high sensor response of about 41 %. In particular, S_TNNi(I) sensor, which was prepared by dropping nickel nitrate solution on the SnO₂ thin film prepared by ion sputtering showed the highest sensor response of about 53 % and complete recovery properties. The responses of S_TNNi(I) sensor increased almost linearly at 0.05 ppm and 0.5 ppm, and its optimum temperature required for the detection of DPGME was 350°C. we will discuss effects of preparation methods and promoters on the sensing properties of SnO₂ thin film sensor for DPGME gas.