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Sensing application of V_2O_5 thin films

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Detection of pollutant, toxic, refining, combustible and process gases is important for system and process control, safety monitoring and environmental protection. Gas sensors based on Metal semiconductor materials (MOS) offer considerable advantages in comparison to other gas sensing methods. Semiconductor sensors are inexpensive to produce, easy to miniaturize, rugged, reliable and can be designed to operate over a range of conditions including high temperatures. Semiconductor sensors can be produced in arrays to allow sensing of multiple species simultaneously and with advances in sensitivity; limits are approaching part-per-million (ppm) levels for some species (T. A. Miller and all, 2006).

The gas sensors based on MOS thick films such as SnO_2 , TiO_2 , WO_3 , V_2O_5 , ZnO , Fe_2O_3 , and In_2O_3 have been used to detect various gases such as ethanol, LPG, CO_2 and CO gases etc (Supab Choopun and all, 2012).

In the present paper, a gas sensing device based on Vanadium oxide thin films (V_2O_5)/ Porous Si (PS) / Si structure has been used to detect CO_2 gas and Ethanol at different concentration. Amorphous and crystalline vanadium pentoxide (V_2O_5) thin films were grown onto monocrystalline silicon and porous silicon substrates using the Dip-coating method. The obtained films were characterized by SEM and FTIR spectroscopy. The results show that the sensitivity of the structure increases with increasing bias potential and concentration of CO_2 and Ethanol vapors.

Biography:

Ayouz- Chebout Katia: was born December 04, 1978 in Algiers. She graduated from the University of Science and Technology HouariBoumedienne of Algiers and Doctoral student in Faculty of Science and engineering FSI in University of M'hamedBougara of Boumerdes in Algeria. His doctoral thesis is conducted in Centre for Scientific Research in Technology of semi-conductors for Energetics CRTSE. Since 2010 she holds the position of attached of research in the same center of research CRTSE.