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Pt-SiC SCHOTTKY DIODE FOR DETECTION OF METHANE GAS, J. H. LEE, Y. H. LEE, C. K. KIM (Dept. of Electrical and Electronic Engr, Soonchunhyang Univ., Asan, Choongnam 336-745 Korea) N. I. CHO (Dept. of Electronic Engr., Sun Moon Univ. Asan, Choongnam 336-840, Korea) D. J. KIM (Dept. of Mat. Sci. & Eng., Seoul National Univ., Seoul 151-742, Korea)

This paper discusses a microelectronic silicon carbide-based methane gas sensor operating at high temperature. A gas sensor utilizing Pt-SiC Schottky diode has been investigated. A Ti layer was sputtered on n-type SiC substrate for ohmic contact, followed by annealing at 450 °C in argon environment. A Pt layer (less than 800 Å) as a catalytic gate was then sputtered on SiC to complete the sensor. We have investigated the change in diode current, ΔI , as function of hydrogen concentration in air at high temperature (higher than 300 °C). A large increase in current upon methane adsorption was shown.

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INFLUENCE OF CATALYST (Pd) LOADING METHODS ON MICROSTRUCTURE AND GAS SENSITIVITY OF SnO₂, K. H. YOON, H. Y. LIM (Dept. of Ceramic Eng., Yonsei Univ., Seoul 120-749, Korea), C. H. KWON, D. H. YUN (LG Corporate Inst. of Tech., Seoul 137-724, Korea)

In order to improve the sensitivity of Pd-loaded SnO₂ semiconductor gas sensors, the influences of amount and method of Pd loading are investigated. The degree of powder agglomeration and the sensitivity were changed with three different loading methods. The coprecipitation and the impregnation after drying methods caused agglomeration of nano-sized primary particles and showed lower sensitivities to propane. The impregnation after calcination method showed a little agglomeration, and consequent higher sensitivity ($R_{air}/R_{gas}=21.5$ for 5350ppm C₃H₈) and the lowest operating temperature (410 °C). The micro-pores between the agglomerates enable the reactive gases to diffuse more easily and react with SnO₂. Pd particles distributed uniformly on the surface of SnO₂ and promoted the electron exchanges between the chemisorbed oxygen ions and SnO₂. It was confirmed by XPS study showing the binding energy decrease of Sn3d core level for the three different Pd-loading methods.

P-067

A STUDY OF GAS SENSING PROPERTIES OF Sn⁺⁴ DOPED α -Fe₂O₃ THIN FILM, E. J. KIM AND G. E. JANG (Dept. of

Chungbuk National Univ., Cheongju, 360-

The tin doped α -Fe₂O₃ thin film were prepared on Al₂O₃ substrate by PECVD method. Sensing properties for reducing gas were tested in a gas chamber. The resistance of films decreased when the thin film was exposed to a reducing hydrocarbon atmosphere. The tin doped α -Fe₂O₃ thin film improved sensing properties. Tin has the effect on suppressing grain growth and crystallization, and increasing the surface area of the sensing element. This study is discussed and compared with the sensing properties of pure α -Fe₂O₃ thin film and tin doped α -Fe₂O₃ film.

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ANALYSIS ON GAS-SENSING PROPERTIES FOR ORGANIC GAS DETECTION OF MALEATE COPOLYMER LB FILMS EUL-SIK LEE, DO-KYUN KIM and YOUNG-SOO KWON

(Dept. of Electrical Eng., Dong-a Univ., Pusan, 604-714, Korea) Experimental results on the gas-sensing properties of maleate copolymer (C₁₈MA-VE₂) Langmuir-Blodgett films are presented. C₁₈MA-VE₂ is used as sensitive materials and deposited on the slide-glass substrates at room temperature using LB method. The results of current-voltage (I-V) measurements exhibit conductivities of order of 10⁻⁷ [S/cm]. Also, the current-time (I-t) measurements are performed to investigate the gas-detection properties of the C₁₈MA-VE₂ LB films in the presence of organic gases just as chloroform, acetone, ethanol, methanol using the apparatus for the gas detection measurement. Several interesting responses are observed at room temperature, such as reversible response, sensitivity and response time. Response times and sensitivities are evaluated 200~250 [sec], 15 [times] ~ 70 [times] by adsorption and penetration of organic gases in the relation concentration of 100 [%], respectively. Thus, it has a possibility to be applied as a gas sensor.