Pd/다결정 3C-SiC 쇼트키 다이오드형 수소센서의 제작

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Fabrication of Pd/poly 3C-SiC Schottky diode hydrogen sensors

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Abstract : This paper describes the fabrication and characteristics of Schottky micro hydrogen sensors for high temperatures by using polycrystalline(poly) 3C - SiC thin film grown on Si substrates with thermal oxide layer using APCVD. Pd/poly 3C-SiC Schottky diodes were made and evaluated by I-V and C-V measurements. Electric current density and barrier height voltage were 2×10^{-3} A/cm^{2}and 0.58 eV, respectively. These devices could operate stably at about 400℃. According to H_2 concentrations, their barrier height(Φ_{Bn}) were changed 0.587 eV, 0.579 eV, 0.572 eV and 0.569 eV, respectively, the current was increased. Characteristics of implemented sensors have been investigated in terms of sensitivity, linearity of response, response rate and response time. Therefore, from these results, Pd/poly 3C-SiC Schottky devices have very high potential for high temperature chemical sensor applications.

Key Words : Poly 3C-SiC, schottky diode, high temperature, hydrogen sensor