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Temperature and Pore Size Dependence of a Nanoporous Platinum Based Hydrogen Senor[1] ADITYA ABBURI, HAROLD FAIRWEATHER JR., WEI JIANG YEH, University of Idaho — In this study, hydrogen sensing properties of nanoporous Pt films have been investigated for different pore sizes at various temperatures (25–100 $^\circ$C) and hydrogen concentrations (100– 1000ppm). The nanoporous thin films were fabricated by a method of cosputtering, dealloying and coarsening. Cu_xPt_{1-x} thin films of thickness 150nm were formed by magnetron sputtering of Cu and Pt. These films were dealloyed in concentrated sulfuric acid to remove Cu. Coarsening of the dealloyed films at various temperatures produced nanoporous Pt thin films of different pore sizes. The morphologies of the nanoporous Pt films were studied by Scanning Electron Microscopy (SEM). Hydrogen sensing properties of the nanoporous Pt film were measured using a resistance transient method. It was found that the sensor response of the nanoporous Pt films was approximately 3.5% at 1000ppm H_2 for a pore size of 35nm at room temperature. The detection limit was lower than 100 ppm at room temperature and the sensor showed repeatability.

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