

Effects of heat treatment and electrode materials on H₂ sensitivity in anodized TiO₂ films

Youn-Ki Jun^a, Hyun-Su Kim^a, Jong-Heun Lee^b, and Seong-Hyeon Hong^a

^aSchool of Materials Science and Engineering
Seoul National University
Seoul, 151-742, Korea

^bDivision of Materials Science and Engineering
Korea University
Seoul, 136-701, Korea

Abstract

The highly sensitive H₂ sensor was fabricated by an anodic oxidation of titanium metal. The effect of electrode materials and subsequent heat treatment on the sensing performance was investigated. The resistance changes were measured during the exposure of sensor to 1% H₂ balanced by N₂. The sensitivity, defined by R_o/R_g (the ratio of resistance in balance gas to that in gas) was more than 10^5 and the response time is less than 15 seconds.

The sensor with a palladium electrode had an excellent sensing property regardless of the heat treatment. However, in the sensor with a platinum electrode, the sensitivity depended strongly on the temperature of heat treatment. Sensing mechanism will be discussed.