

Humidity-Sensing Characteristics of $\text{TiO}_2\text{-SnO}_2$ Prepared by Coprecipitation and Precipitation Methods

Ji Won Joo, Jong-Heun Lee¹ and Soon Ja Park

Department of Inorganic Materials Engineering,
College of Engineering, Seoul National University,
Shilim-Dong, Kwanak-Gu, Seoul 151-742, Korea

¹Samsung Advanced Institute of Technology,
P. O. Box 111, Suwon 440-600, Korea

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The sensing characteristics of the $\text{TiO}_2\text{-SnO}_2$ system show large differences between the solid solutions and the simple mixtures of TiO_2 and SnO_2 . The different degrees of forming solid solutions in this system affect the kinds of adsorbed water on the surfaces of samples, which results in different sensing characteristics between the simple mixture and the solid solution. These observations are closely related to the humidity sensing characteristics of the sensors prepared with TiO_2 or SnO_2 alone. The simple mixtures and SnO_2 showed similar sensing characteristics, which strongly suggests that the physisorbed water on their surfaces has important effects on the characteristics. The solid solution and TiO_2 showed similar trends in the sensing characteristics, and the resultant data show some evidence that the chemisorbed water might control the sensing characteristics in both TiO_2 and the solid solution.

1. Introduction

The content of water vapor in the atmosphere is represented as humidity and has great effects in various fields of industry, such as science and engineering. Therefore, the importance of sensing and controlling humidity has been emphasized. Among humidity-sensing materials, ceramics of metal oxides, rather than electrolytes or organic polymers, are leading materials because of their thermal, physical and chemical stability.^(1,2)