

Review

# Oxygen influence on the interaction mechanisms of ozone on SnO<sub>2</sub> sensors

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Received 29 May 2007; received in revised form 29 July 2007; accepted 30 July 2007

Available online 19 August 2007

## Abstract

This paper deals with the influence of the test procedure on the electrical responses of tin dioxide sensors to ozone under atmospheric conditions. For an operating temperature of 350 °C, the gas sensor responses underline two effects: the exposure time to ozone and the balance between the exposure time to ozone and the exposure time to the purified air. Based on experimental results, the interpretation of the interaction processes between ozone and the sensitive layer is discussed.

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**Keywords:** Tin dioxide gas sensor; Ozone; Exposure time

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## 1. Introduction

In recent years, in view of the pollutants consequences on human health, air quality prediction appears as an urgent need. Ozone is a particular toxic gas. In many developed countries, the maximum allowed safety concentration of ozone is 50 ppb for continuous exposure and 100 ppb for short-term exposure. Actually, the measurements of urban air pollution are performed

by air quality control networks; thanks to stations provided with selective analyzers for many pollutants. Despite their good performances, their high cost and uneasy implementation made them unsuited to realize cartography of pollution with high spatial resolution. For such application, chemical gas sensors are very attractive and can constitute a low cost tool to increase the network.

In this context, the required performances for the sensors, besides a low price, are good sensitivity, stability and selectivity. The semiconductor sensors based on tin dioxide are known for presenting a good compromise between those three metrological parameters. Furthermore, it is easy to manufacture microelec-

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