

Solid State Electrochemical Gas Sensors Based on Stabilized Zirconia and Oxide Electrodes

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Abstract:

The harmful air pollutants (especially NO_x) from car exhausts caused a wide variety of adverse health and environmental impacts with increase of the automotive vehicles in city. To accurately monitor and precisely control the harmful gas, the high performance gas sensor has been urgently desired. The solid state electrochemical gas sensors based on stabilized zirconia and oxide electrodes have been proven to be one of the most reliable devices enable to accomplish the desirable sensing performances, in terms of their special features such as high temperature operation, chemical and mechanical stability, and relative low fabricating cost. In order to improve the sensing performance of gas sensors, many studies have been focused on exploring new metal oxides sensing electrode materials. Besides, the triple phase boundary (TPB) where the electrochemical reaction takes place is very important for enhancing the sensing properties. This paper is focused on reviewing our work in terms of the development of novel sensing electrode material and the fabrication of high performance TPB for enhancing the sensing properties at elevated temperature.

Key words: Gas sensor; solid state electrochemical; stabilized zirconia; oxide electrode; three phase boundary.

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