

Highly Sensitive, Low-Cost Oxygen Gas Sensor Based on ZnO Nanoparticles

Authors : Xin Chang, Daping Chu

Abstract : Oxygen gas sensing technology has progressed since the last century and it has been extensively used in a wide range of applications such as controlling the combustion process by sensing the oxygen level in the exhaust gas of automobiles to ensure the catalytic converter is in a good working condition. Similar sensors are also used in industrial boilers to make the combustion process economic and environmentally friendly. Different gas sensing mechanisms have been developed: ceramic-based potentiometric equilibrium sensors and semiconductor-based sensors by oxygen absorption. In this work, we present a highly sensitive and low-cost oxygen gas sensor based on Zinc Oxide nanoparticles (average particle size of 35nm) dispersion in ethanol. The sensor is able to measure the pressure range from 103 mBar to 10⁻⁵ mBar with a sensitivity of more than 102 mA/Bar. The sensor is also erasable with heat.

Keywords : nanoparticles, oxygen, sensor, ZnO

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