



Gas Sensing Structure of CuO/Cu₂O Doped with Sn for Ethanol with Potential Detection in Exhaled Breath

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Abstract. Gas sensor industry, being in constant development, has its own priorities in different fields. One of the attractive challenges is to make a gas sensing device that through the collected data from the exhaled breath, will make an accurate diagnostic of a potential patient with certain diseases. Researches have been made on different VOCs in multiple concentrations as being biomarkers to certain diseases, yet there is still more to discover. Nowadays there are technologies that can describe the components of exhaled breath, such as gas chromatographs, which are pretty expensive and have special sample collection systems. Researching a gas sensing structure based on metal oxides could come as an innovative solution to the field. Mixed copper oxides material has its own research, where being in different structures and tuned through different processes, can make a lot of improvement to gas sensor properties. A Cu₂O/CuO sample, doped with Sn, showed interesting results when applying ethanol vapors. Ethanol being known as an indicator for alcohol level in blood, has also the potential to be a biomarker to auto-brewery syndrome. A relatively good detection of ethanol vapor was registered at temperature of 300 °C degrees with the value of response about 220 percent. Thus, a relatively good sample for a potential biomarker as ethanol was studied which can be further developed and tested for medical devices.

Keywords: Gas · Sensor · Ethanol · Metaloxide · Doped

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