

## Health Safety Sensors Based on Doped Metal-Oxide Gas Sensing Structures for Formaldehyde Detection

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**Abstract.** Although known as a toxic and carcinogenic compound, formaldehyde is still used in different industries and occupational settings due to its properties [1] such as sea-food industry [2] and medical human anatomy laboratories [1]. Recent studies [3,4] shows that formaldehyde pollution event at low concentration poses a threat to human health and it may reach even higher concentration values in indoor air of building that in open air. It enters body through the respiratory tract and can be cause of sick building syndrome, can cause asthma in both children and adults as well as some brain diseases, being also associated with the cause of nasopharyngeal cavity cancer and leukemia [3].

Thus, a motivation is growing toward researching and manufacturing acquirable methods and technologies for fast detection of different concentrations of formaldehyde in different industries and conditions which may be metal-oxide based sensor, as they showed a good potential in other works [5]. In this regards, in this paper different structures of copper oxide and zinc oxide doped with different particles have been studied and compared to show the potential of using such sensors and further research.

Measurements resulted in interesting data which showed a relative good response of the studied nanostructures at relative higher operating temperatures such as 300 °C and 400 °C, especially for zinc oxide doped with tin. Also the obtained data showed that at this operating temperatures sensors tend to respond only to gas, escaping the influence of water vapors.

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