

## **High-Performance Gas Sensors Using Heterostructures based on Binary and Ternary Metal Oxides**

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### **Abstract**

The gas sensing properties of heterojunctions based on binary and ternary metal oxides ( $\text{CuAl}_2\text{O}_4/\text{Al}_2\text{O}_3/\text{CuO}/\text{Cu}_2\text{O}$ ,  $\text{ZnAl}_2\text{O}_4/\text{ZnO}$  and  $\text{Zn}_2\text{SnO}_4$ ) were investigated in detail and demonstrated excellent sensitivity and selectivity to a series of gases and volatile organic compounds (VOCs), such as  $\text{H}_2$ , CO and ethanol. The dynamic measurements showed excellent response stability at low and high relative humidity, which is very important for applications like diseases detection by breath analysis.

*Keywords: gas sensors, ternary semiconductors, nanosensors, humidity tolerance, temperature sensors, volatile organic compounds, semiconductor materials, hydrogen, zinc oxide*

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