



## SELECTIVE CO SENSING USING NANOSTRUCTURED $\text{TiO}_2$ GAS SENSORS: A REVIEW

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*Submitted: Sep. 23, 2016*

*Accepted: Nov. 3, 2016*

*Published: Dec. 1, 2016*

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*Abstract- Fabricating a sensor for a toxic gas like carbon monoxide (CO) has been a constant need in many domestic and industrial applications. Although many sensors are commercially available, research is focused on developing a selective CO sensor with higher sensitivity, selectivity and low operating temperature. This paper reviews the fabrication, comparison and evaluation of different nanostructured titanium dioxide ( $\text{TiO}_2$ ) sensors used in CO detection. After a brief description of the structural properties of  $\text{TiO}_2$ , the article presents sensing mechanism in semiconductor metal oxide sensors. For a reducing agent like CO, the surface reactions result in the reduction of sensor resistance. The parameters associated with sensor performance are discussed. The article presents a summary of main research findings in this field. Nanostructured morphologies offer better sensing performance and selectivity. The improved performance due to nanostructured  $\text{TiO}_2$  is highlighted. The review clarifies the specific role of  $\text{TiO}_2$  for the future research.*

**Index terms:** Carbon monoxide (CO); metal oxide semiconductors; nanomaterials; sensitivity; titanium dioxide( $\text{TiO}_2$ ).