

## A Facile and Room Temperature Growth of Pd-Pt Decorated Hexagonal-ZnO Framework and Their Selective H<sub>2</sub> Gas Sensing Properties

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**Abstract :** The attractive and multifunctional properties of ZnO make it a promising material for the fabrication of highly sensitive and selective efficient gas sensors at room temperature. This presented article focuses on the development of highly selective and sensitive H<sub>2</sub> gas sensor based on the Pd-Pt decorated ZnO framework and its sensing mechanisms. The gas sensing performance of sputter made Pd-Pt/ZnO electrode on anodized porous silicon (PSi) substrate toward H<sub>2</sub> gas is studied under low detection limit (2–500 ppm) of H<sub>2</sub> in the air. The chemiresistive sensor demonstrated sublime selectivity, good sensing response, and fast response/recovery time with excellent stability towards H<sub>2</sub> at low temperature operation under ambient environment. The elaborate selective measurement of Pd-Pt/ZnO/PSi structure was performed towards different oxidizing and reducing gases. This structure exhibited advance and reversible response to H<sub>2</sub> gas, which revealed that the acquired architecture with ZnO framework is a promising candidate for H<sub>2</sub> gas sensor.

**Keywords :** sputtering, porous silicon, ZnO framework, XPS spectra, gas sensor

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