

# 4<sup>th</sup> International Conference on **Nanotek & Expo**

December 01-03, 2014 DoubleTree by Hilton Hotel San Francisco Airport, USA

## Nanostructured metal oxides thin films as high-quality humidity sensor

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Present paper deals synthesis and characterizations of nanostructured metal oxides like  $\text{La}_2\text{O}_3$ ,  $\text{Nd}_2\text{O}_3$ ,  $\text{Nb}_2\text{O}_5$ ,  $\text{ZnO}$  and ferrites akin to  $\text{Fe}_2\text{O}_3$ ,  $\text{NiFe}_2\text{O}_4$ ,  $\text{ZnFe}_2\text{O}_4$  and  $\text{CuFe}_2\text{O}_4$ . The sensing materials were characterized by SEM, XRD and UV-Visible spectroscopy. The thin films of synthesized materials were prepared by using sol-gel spin coating techniques on separate alumina substrates. Also for comparative observations, the thick films and pellets of materials were fabricated by using screen printing technology and hydraulic pressing machine. After it their humidity sensing properties were investigated. The variations of resistance with %RH of the different sensing elements were measured. Out of all investigated material, the thin film of  $\text{ZnFe}_2\text{O}_4$  gave maximum average sensitivity  $50 \text{ M}\Omega/\% \text{RH}$  with  $\pm 1\%$  hysteresis and the results were found to be reproducible after three months with  $\pm 2\%$  hysteresis. These experimental results identifies that fabricated nanostructured thin film of  $\text{ZnFe}_2\text{O}_4$  is excellent sensing elements for humidity sensing.

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