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## Studies of conducting polymers nanocomposites and its applications

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The Polyaniline (PANI) has emerged as one of the most promising conducting polymers, because of its wide spread applications and due to the combination of unique properties like simple preparation and doping procedure, good environmental stability, relatively high conductivity and low cost. The inorganic-organic composites containing polymer as the organic base and Gallium oxide, Vanadium Pentoxide and Indium oxide as inorganic part have been used for studying its gas sensing. These composites have been synthesized by insitu deposition technique by placing fine grade  $Ga_2O_3$ ,  $In_2O_3$  and  $V_2O_5$  in polymerization mixture of aniline. The results are well supported by FTIR spectra, SEM, XRD and Conductivity measurements. High temperature, conductivity measurements show thermal activated behavior. It is observed that electrical resistance increases with an increase in the temperature. In case of PANI- $V_2O_5$ , PANI- $In_2O_3$  and PANI- $Ga_2O_3$  composites both the PANI sensing mechanism of swelling and sensing mechanism of surface charge are responsible for variation of resistance within the sensing material. Therefore, it is observed that PANI- $V_2O_5$ , PANI- $In_2O_3$  and PANI- $Ga_2O_3$  composites to be a competent sensing material for LPG and this may be due to formation of surface charge and presence of capillary pores. Similar behavior for the Polymer / Nano metal oxide composites such as Polyaniline-Tungsten oxide, Polyaniline-Cobalt oxide and Polyaniline- Cerium oxide have been observed for its humidity and Gas sensing. Similarly, conducting polymers have found to have applications in Biology in Bio sensors, anti bacterial action, pigeon pea plant growth, microwave absorbers etc.

### Biography

M V N Ambika Prasad has received MSc degree in Physics from Osmania University, Hyderabad and PhD in Physics from Indian Institute of Technology (IIT), New Delhi. He is currently a Professor of Physics at Gulbarga University, Gulbarga. His research interest includes conducting polymer and nanocomposites, understanding the electrical and thermal behaviour of the materials at nano size and sensing behaviors of various conducting polymers exposed to gas and humidity.

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