

Serial No	Requirement	Details
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7	Brief account of your research interest with special focus on nanoscience and technology	<p>Main research interests are in the areas of synthesis, processing, and properties of advanced functional ceramics and their structure property correlations. Chemical processing of nano particles of functional oxides for fuel cell and sensor applications is the major area of research activity.</p> <p>Focus is mainly to synthesise new and novel nano materials with enhanced properties for diverse applications. Major thrust is given on chemical synthesis and characterization of nanoparticles of semiconducting oxides such as SnO₂, TiO₂, CeO₂ for gas sensor applications. Design and Development of nano particles by template technique is another area of interest. Recently, we have found that nano particles of tin dioxide and antimony doped tin dioxide exhibits extraordinarily high butane sensitivity with extreme selectivity. This development clearly underscores the effect of nano size in developing highly sensitive gas sensor materials with preferred selectivity. Recent interest is on understanding the underlying mechanism in achieving high gas sensitivity and selectivity by nanoparticles of oxides. The studies on nanoparticles of oxides for gas sensor development and their practical limitations in developing ultrasensitive sensors, has motivated interest in the development of carbon nanotube based gas sensors. Development of gas sensors based on carbon nanotubes is an emerging area of research with immense potential for technological applications. It is anticipated that the CNT based sensors may exhibit ultra sensitivity (ppb/ppm levels of detection) at significantly reduced or at room temperature by virtue of their exotic surface characteristics. Research on the synthesis of metal nanoparticles and their impact on developing biosensors is another exploring area of interest.</p>
8	Key words	Advanced materials, chemical and bio sensors, semiconducting oxides, combustion synthesis, sonochemical synthesis, biotemplate, oxide-ion conductors, SOFC, manganites and multiferroics