



**INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS**

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Programme of Study : Ph.D.

Thesis Title: Ultrasound Assisted Synthesis and Characterization of Polymethyl Methacrylate (PMMA) Nanocomposites

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SHORT ABSTRACT

The thesis dealt with ultrasound-assisted synthesis and characterization of polymethyl methacrylate (PMMA) based nanocomposites with 4 different kinds of fillers, viz. PMMA/Cloisite 30B, PMMA/ZnO, PMMA/RGO and PMMA/magnetite. Both base polymer PMMA and the filler materials were chosen on the basis of their versatile applications. Except for the clay, the other nanofillers have also been in-house synthesized using sonication. The experimental parameters have been optimized using statistical design of experiments. Variations in different physical properties (mechanical/ thermal/ electrical/ magnetic/ optical) of the nanocomposites have been mapped as a function of the loading of the nanofiller. The results have been analyzed vis-à-vis the experimental conditions. The analysis of these studies has provided an insight into the inter-relation between properties of the nanocomposites and the properties of polymer and nanofiller in pristine form. Comparison of these properties with previous literature employing mechanical agitation has given a quantitative account of the enhancement in physical properties induced by sonication.