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Nanocomposites of PMMA and rose-like BiOCl nanostructure: Synthesis and characterization

Nanocomposites of PMMA: BiOCl with different concentrations of BiOCl (5, 10, 15 wt%) were prepared by using simple solution cast technique. Prepared nanocomposites as well as BiOCl nanostructure characteristics were examined by using XRD, FESEM and EDAX. Morphology reveals that the developed nanostructure of the filler (BiOCl) is of rose like geometry, which composed of dozens rapidly grown nanosheets of thickness 53nm. Uniform distribution and tight adherence of nanoparticles with PMMA matrix has also been confirmed through FESEM images. It is witnessed that the surface morphology changes from smooth to rough with increase in weight ratio of filler might be due to particle-particle interaction dominance over matrix-particle interactions. Further the newly emerged sharp peaks in the XRD pattern confirm the presence of nano-BiOCl crystallites within the polymeric matrix. The obtained results reflect that the properties of polymer nanocomposites depend upon the type of nanomaterial such as shape, concentration, size, and interaction with polymer matrix, which find its application in optical devices, fuel cells, and chemical sensors.

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