

Development and characterization of nanostructured polymer composite materials

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Polymers are of profound interest to society and are replacing metals in diverse fields of life, they seem to provide a solution to almost every deed in life, from preparing daily commodities to the highly sophisticated artificial heart valve. Since desirable properties can be conveniently attained by tailoring the polymer structure and also by incorporating additives. Scientists have been enthusiastic to explore the possibility of transforming insulating polymers into materials envisaging such special characteristics like low density, low cost, ease of fabrication, flexibility of design, low energy and labour requirements for fabrication and processing, which make them a class of versatile materials capable of meeting even the most stringent specifications of modern technology. Due to the excellent properties synergistically derived from polymer and inorganic materials, polymer composite materials are used in many fields. In the recent years, these composite materials replaced the pristine polymers due to their strength and stiffness and possess evolutionary means of achieving properties that cannot be realized with single materials. The structural characterization is done by TEM, SEM, EDAX, XRD, FT-IR, TGA and DTA studies.

Keywords: TEM, SEM and DTA

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Metal oxide nanoparticles as an adsorbent for removal of Pb

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In this study, adsorption process performance was assessed using metal oxide nanoparticles for wastewater treatment containing lead in a laboratory scale.

Nickel oxide nanoparticles and copper oxide nanoparticles were prepared and fully characterized considering their adsorption properties (surface area and pore volumes) as well as their chemical structure and morphology. Application of using the produced metal oxide nanoparticles for removal of lead was evaluated in a batch operation system. Studying of the operating conditions namely; effects of contact time, dosage of adsorbent, initial concentration as well as effect of pH were carried out. Also kinetics and isotherm study that describe the adsorption process are carried out.

Biography

Mona E. Ossman received her Ph.D. in Chemical engineering from Wayne State University, USA in 2005. She has completed her M.Sc. and B.Sc. from Alexandria University, Alexandria, Egypt. She is currently working as an Associate Professor at Pharos University. Her research interests involve synthesis of new materials and their applications as adsorbents in industrial waste water treatments. She has published more than 15 papers in reputed journals and serving as an editorial board member and reviewers for reputed journals.

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