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Development of Magnetic Nanocomposites from Shrimp Shells

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Abstract

Shrimp shell waste, a significant byproduct of the seafood industry, presents a substantial environmental challenge [1]. This study explores the valorization of this waste material into value-added products through the development of magnetic nanocomposites. Chitosan, a biodegradable and biocompatible polymer, was extracted from shrimp shells and subsequently was used as bio-based material for the synthesis of magnetic nanocomposite. The influence of various factors on the synthesis of magnetic nanocomposites was studied. The structural, morphological, and chemical properties of chitosan and the magnetic nanocomposite were investigated using FTIR, XRD, SEM-EDX, BET and VSM. The resulting nanocomposites exhibited excellent magnetic properties and high surface area. The potential applications of these nanocomposites include wastewater treatment, drug delivery, and biosensing. This research provides a sustainable solution for shrimp shell waste management while offering promising opportunities for the development of advanced materials with diverse applications.

Key words: Shrimp shells, Chitosan, Waste material, Magnetic nanocomposite, Characterization

References

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