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Original Research Article

Investigation of Morphology and Antibacterial Properties of Nylon 6, 6/PANI/ZnO Nanocomposite

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ABSTRACT

In this paper, the Nylon 6,6/Polyaniline/Zinc oxide nanocomposite with different weight loadings of each component were prepared. Antibacterial properties of the prepared nanocomposites were investigated against gram-positive Staphylococcus and gram-negative Escherichia coli (E. coli) bacteria using Resazurin indicator and optical density measurements. The results showed that the addition of equal quantities of Polyainine and ZnO nanoparticles with 5% wt. of each component to Nylon 6,6 produce the best antibacterial effect. The antibacterial effect of nanocomposite is higher on gram-negative bacteria in compared to gram-positive one. Investigation of the morphologies of optimum nanocomposite by FESEM showed its proper morphology, sufficient porosity, and high surface area for contact with bacteria. Elucidation of functional groups in optimum specimen by FT-IR revealed the existence of them in nanocomposite representing the successful formation of nanocomposite.

Keywords: Polyaniline, ZnO, Nylon 6,6, Antibacterial