



Optimizing Precipitation Conditions of BNC/Fe₃O₄ Composites

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Advancements in technology often rely on the development or enhancement of materials. Bacterial nanocellulose (BNC) has found diverse applications in fields such as biomedicine, ecology, and electronics, leading to increased interest in BNC-based composites^{1,2}. Understanding the synthesis parameters that affect the crystal structure and morphology of these composites is crucial, as it directly impacts their functional properties. In this study, a composite material based on bacterial nanocellulose (BNC) and ferromagnetic particles Fe₃O₄ was investigated. BNC was obtained through the activity of bacteria during vinegar fermentation for 7 days in a suitable medium^{3,4}. The research aimed to optimize the conditions for Fe₃O₄ precipitation by varying the standing time interval of BNC films in a neutral medium of distilled water after biosynthesis. Samples were allowed to stand for 7 days and 14 days before precipitation. The results showed that the samples standing for 14 days were not adequate, i.e., Fe₃O₄ precipitation was not achievable. The impact of different synthesis conditions was analyzed using SEM-EDS and FTIR methods.

Keywords: precipitation, bacterial nanocellulose, optimization

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