

Preparation and characterization of bacterial cellulose–montmorillonite nanocomposites

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In recent years, the nanocomposites of polymers with various clays have been extensively investigated due to their cost effectiveness and potential applications in different fields. The material properties of the nanocomposites are superior to the pure polymers. Montmorillonite (MMT) is the widely used clay in the preparation of nanocomposites which improves the properties of the final product up to 10-folds. Bacterial cellulose (BC) is a biopolymer that has well-defined applications in various fields. In the present study, composites of BC with MMT were prepared by surface penetration method in order to obtain biomaterials with enhanced physicochemical properties. The structure of the obtained composite was characterized by FE-SEM, FT-IR and XRD analysis. The results showed that MMT particles successfully penetrated into the polymer matrix of BC and were distributed on surface and in the interior of the matrix. The physicochemical properties of the newly prepared nanocomposites were also superior compared to the pure BC.