

The effect of different amount MMT in PVA properties

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Abstract

A series of nanocomposite hydrogels were prepared by evaporation-induced assembly with the introduction using polyvinyl alcohol (PVA) as the polymer matrix and natural hydrophilic Albanian montmorillonite (MMT) 0–10 wt %. quantity, without any changes, in the form of composite aggregates. The effects of nanoclay content and sonication on the microstructure and morphology of the nanocomposite as well as its properties (physical, mechanical and thermal) were investigated. Microstructure and morphology were studied by Fourier transform infrared spectroscopy (FT-IR), scanning electron microscopy (SEM), differential scanning calorimetry (DSC), and water absorption kinetics. The results show that MMT acts as a shaper and this effect is analogue to the amount of MMT. Also, the water uptake kinetics deviate slightly from Fick's law due to slow relaxation of glassy polymer matrix, with or without MMT. Based on the results obtained, the PVA/MMT nanocomposite hydrogel has emerged as a viable candidate for biomedical applications.

References

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