Solid-State ^{1}H and ^{27}Al NMR Study of Polyurethane Nanocomposites Containing Halloysite Nanofiller

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Abstract. Polyurethane-based nanocomposites incorporating hallyosite nanotubes (HNTs) as nanofiller were studied using ^{1}H and ^{27}Al nuclear magnetic resonance (NMR) spectroscopy to evaluate the influence of HNT content on the resulting nanocomposite structure and the mobility of polyurethane chains. The presence of HNT nanofiller affected molecular mobility within the studied composites, as evidenced from the changes in intensities and linewidths obtained from deconvolution of the broad-line ^{1}H NMR spectra. Furthermore, the ^{27}Al NMR spectra provided insights into the dispersion state of the HNTs within the polymer matrix and revealed potential structural alterations of the nanofiller following its incorporation into the polyurethane matrix.