

SYNTHESIS AND XRD CHARACTERIZATION OF NATURAL RUBBER/CLAY NANOCOMPOSITE

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ABSTRACT

Natural rubber/clay nanocomposites were synthesized via solvent method with the presence of cetyltrimethylammonium bromide (CTAB) as the compatibilising agent. Compatibilising agent is very important to compatibilize the chemistry of the clay and the hydrophobic of the rubber matrix. The composites were divided into various percentages of organoclay and the nanostructure of the composite was investigated by Shimadzu X-ray diffractometry (XRD) with radiation at 60kV and 80mA. The XRD patterns of NR/clay nanocomposites showed that the characteristics diffraction peak of the organoclay disappeared for nanocomposite with one percent to five percent of organoclay in the composite. This is attributed to the homogenous dispersion of the organoclay in the natural rubber matrix and forming an exfoliated nanocomposite. Between seven to fifteen percent of organoclay, the graph slowly showed a strong peak at $2\theta = 2.6$ with the d-spacing = 33.953. This happened because of the insertion of the natural rubber in between the clay layer to form an intercalated nanocomposite. Thus, by varying the concentration of modified clay, different type of NR/clay nanocomposite can be obtained.

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