



**NATURAL RUBBER-BASED GREEN NANOCOMPOSITES BY LATEX  
COMPOUNDING WITH CELLULOSE NANO FIBERS**

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Natural rubber (NR) based nanocomposites with cellulose nano fibres were produced. The mixture of the natural rubber latex and cellulose nano fibers were blended well by using a home-use mixer and a stirrer, and then dried in air or in a vacuum. Their mechanical properties of the composite such as strength and modulus had a good correlation with their density. Especially it can be seen that there is significant effectiveness in a stirrer mixing process, which results in the improved uniform dispersion of nano fibers. The transmission electron microscopy (TEM) and X-ray diffraction (XRD) were employed to characterize the microstructure of the nanocomposite. The results showed that the nanocomposite exhibited a higher glass transition temperature, lower  $\tan \delta$  peak value and slightly broader glass transition region compared with pure NR. The gas barrier properties of the NR/cellulose nanocomposites were remarkably improved by the introduction of nano scale cellulose because of the increased tortuosity of the diffusive path for a penetrant molecule. The nanocomposites have a unique stress-strain behavior due to the reinforcement and the hindrance of cellulose layers to the tensile crystallization of NR.