

FTIR SPECTROSCOPY ANALYSIS OF THE PREPOLYMERIZATION OF PALM-BASED POLYURETHANE

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ABSTRACT

The palm kernel based polyurethane (PU) was synthesized by prepolymerization method with various isocyanate/ polyol group ([NCO/OH]) ratio in ambient temperature under nitrogen gas. The presence of the urethane bond was observed in all the FTIR spectra of the PU. The carbonyl peak was identified at 1700 cm^{-1} while the disappearance of isocyanate peak ($-\text{NCO}$) was observed around 2270 cm^{-1} , indicating a complete usage of the diisocyanate. However, the absorption peak of the carbonyl group ($-\text{C}=\text{O}$) in the urethane bond shifted to the left when the diisocyanate content decreased. The FTIR spectroscopy analysis justified that the diisocyanate was the main contributor in the formation of the hard segment of the PU. When the diisocyanate content is decreased, the formation of hard segment of PU will be affected and lowered the extent of polymerization of urethane bond in the PU system. Hence, PU1 may have the strongest urethane bond compared to others.

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