SYNTHESIS AND CHARACTERIZATION OF HYDROLYSIS PALM KERNEL OIL-BASED POLYURETHANE

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This study was conducted to investigate the hydrolysis reaction of rigid palm-based polyurethane. Rigid polyurethane (PU) was synthesized by using monoester-OH kernel oil (polyol). The resulting PU sample was immersed in an aqueous solution of sodium hydroxide (NaOH) concentrations of 0%, 10%, 20%, 30% and 40%. NaOH alkaline aqueous solution can accelerate the rate of hydrolysis. Samples of PU cake were hydrolysable and filtrate every 7, 14, 21 and 28 days. Weights taken showed mass of PU hydrolysable were rise when wet. It showed the PU swelled caused by the absorption of NaOH solution. After the sample is dried, cakes PU hydrolysable were taken its mass, and found its mass was reduced lower than the mass before the hydrolysis reaction is carried out. It showed part of the structure of the PU was degraded as a result of hydrolysis reaction. The higher the concentration of NaOH aqueous solution, the higher the mass of the material decomposes. FTIR spectroscopic analysis showed the decomposition of PU structure through loss absorption peak of C=O, C-O-C and C-N. Image analyzer optical microscope showed the structure of PU particle is reduced and the bond between the particles was damaged. SEM analysis also conducted towards PU control. The morphology of PU structures was porous after the reaction. Despite from that, it was concluded that the decomposition of PU through hydrolysis reaction causes termination chain of PU, in which the soft segment monoester-OH degrade, while the hard segment with cross-linked remained in the structure of the PU.