SYNTHESIS OF USED FRYING-OIL BASED POLYOL FOR RIGID POLYURETHANE FOAM

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ABSTRACT

SYNTHESIS OF USED FRYING-OIL BASED POLYOL FOR RIGID POLYURETHANE FOAM

The Used Frying-Oil (UFO) that usually threw out and become waste have potential to be used as the starting material of synthesizing polyurethane. This study was carried out to determine the potential of UFO in preparation of rigid polyurethane (PU) foam. The raw UFO was first treated by filtration using food strainer and cheesecloth to remove the suspended particles and heated under the temperature of 105 – 110 ℃ for 1 hour. Next, the filtered UFO was mixed with polyhydric compound to synthesize polyol via transesterification reaction. The UFO-based polyol was then combined with other chemicals at various ratios to form PU rigid foam. The UFO-based polyol showed the decreased in free fatty acid percentage (% FFA) from 1.187 % to 0.70 % and increase in viscosity, from 60.5 mPas to 150.5 mPas when compared to the unfiltered UFO. No alteration of functional group observed after filtration as proven by Fourier Transform Infrared (FTIR) Spectroscopy. The FTIR spectra of UFO-based polyol showed the formation of hydroxyl (OH) absorption peak at 3400 cm^{-1}. The formation of urethane linkage (NHCOO) backbone in PU foam was confirmed using FTIR. The morphological structure of the surface was analyzed at magnification 20x and 50x. The properties of PU foam are highly dependent on the chemical composition. This study showed that UFO exhibit promising potential as raw material for PU formation.