

Polymerization of bio-polyurethane with polyol obtained from liquefaction of saw dust and isocyanate, and its optimization

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Polyurethane(PU) foams were prepared according to the experimental plan of central composite design(CCD). Liquefied polyol was prepared by lignocellulosic liquefaction of biomass(saw dust, *Larix kaempferi*) under the optimal liquefaction condition suggested by Lee et al.. The density, cream time, rise time and compressive strength of the PU foams prepared in this study were applied as dependent variables of process condition for the PU foam-preparation, and were measured. The distribution of the density and the compressive strength of the PU foams prepared in this study were turned out to be nearly consistent with those of PU foam, respectively, reported by Xu et al. and Alma et al.. The correlation of their dependent variables with three independent process variables such as stirring period, the ratio of liquefied polyol to polyethylene glycol, and the amount of added distilled water, was regressively analyzed by response surface methodology. In addition, the proper condition for the preparation of the PU foams, was suggested according to the degree of development and the status of cells of the PU foams prepared in this study, observed by SEM.