

Enhanced acoustic and physical properties of polyurethane foam with Isophorone diisocyanate

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The various properties of polyurethane foams are related to their morphology, affected by initial reaction rate of their formation. In this study, the aromatic isocyanate (methylene diphenyl diisocyanate, MDI) and aliphatic isocyanate (isophorone diisocyanate, IPDI) were mixed with certain ratios to fabricate the polyurethane foams. And then, the effects of isocyanate ratios on acoustic and mechanical properties were investigated. Consequently, the pore size and numbers decreased with increasing IPDI contents from reduced pore formations due to high asymmetry molecular arrangements. The highest acoustic activity was achieved at optimum aliphatic isocyanate content. Mechanical strengths of polyurethane foams were also dependent on the aliphatic isocyanate contents, and it is recommended to have enough aging time for completion of reactions from remaining NCO functionalities.