Effect of polyol molecular structures on the comfort property of flexible polyurethane foams

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Polyurethane foams are used in various industries because of their inexpensive cost, easy processability, light weight, and ability for versatile applications. Especially, in automobile industry, flexible polyurethane foams are applied for interior materials such as cushioning parts. Seats for vehicles should possess strength to hold passengers up and elasticity to absorb vibrations which occur during driving. These two properties are mainly related to molecular structures of polyols. Therefore, in order to manufacture polyurethane foams with the best comfort properties, it is important to analyze the relationships between molecular structure of polyols and the comfort property of flexible polyurethane foams. In this study, base polyols with different molecular weights, copolymer polyols with different hard segment contents, and cell openers with different ethylene oxide contents were investigated. To compare the comfort properties of fabricated polyurethane foams, hysteresis loss, sag factor, stress relaxation, compression set, and vibration transmissibility were examined.