

Properties of Rigid Polyurethane Foam for Imitation Wood Blown by Distilled Water and Cyclopentane

Authors : Ratchanon Boonachathong, Bordin Kaewnok, Suksun Amornraksa

Abstract : Rigid polyurethane foam (RPUF) used for imitation wood is typically prepared by using 1-Dichloro-1-fluoroethane (HCFC-141b) as a blowing agent. However, this chemical is a hydrofluorocarbon which severely causes ozone depletion to the atmosphere. In this work, a more environmental-friendly RPUF was prepared by using distilled water and cyclopentane (CP) as alternative blowing agent. Several properties of the prepared RPUF were investigated and measured such as density (kg/m^3), surface hardness (shore D), and glass transition temperature ($^{\circ}\text{C}$). It was found that when the amount of the blowing agents decreased, the foam density is increased as well as the surface hardness and glass transition temperature. The results showed that the proper amount of water and cyclopentane blowing agent is around 0.3-1.2% and 0.5-1.3% respectively. And the new RPUF produced has a good potential to substitute for a conventional RPUF.

Keywords : blowing agent, cyclopentane co-blown, imitation wood, rigid polyurethane foam, surface hardness

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