

Effects of Various Liquid-Type Additives on the Thermal Insulating Properties of Rigid Polyurethane Foams

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The effects of liquid-type additives on the morphology, thermal conductivity, and mechanical strength of polyurethane (PUR) foams were investigated. The PUR foams synthesized with perfluoroalkane showed the smaller average cell diameter and lower thermal conductivity than PUR foams prepared with the propylenecarbonate or acetone. The perfluoroalkane likely acted as a nucleating agent during the formation of the PUR foams. The addition of perfluoroalkane seems to induce the smaller cell size of the PUR foams probably due to lower surface tension of the polyol and perfluoroalkane mixture, resulting in high nucleation rate. The compressive strength of the PUR foams prepared with perfluoroalkane was higher than the PUR foams prepared with the propylenecarbonate and acetone.