

Impact-peel Strengths of Flexible Epoxy-based Structural Adhesives at Low Temperatures

권이슬, 허지윤, 최영선*
부산대학교
(choe@pusan.ac.kr*)

In this study, several types of flexible epoxy-based structural adhesives have been prepared to improve impact-peel strengths at low temperatures. Flexible epoxies containing short or long thermoplastic backbones are synthesized and core shell rubber (CSR) particles are dispersed in flexible epoxies. Additionally, nano-sized inorganic particles are added to flexible epoxy-based structural adhesives. Dicyandiamide (DICY) as a curing agent and 1-2(2-cyanoethyl)-2-ethyl-4-methylimidazole (2E4Mz-CNS) as a catalyst are used in the epoxy systems. Impact-peel strength tests were performed at -40°C . Both CSR and flexible epoxy have significantly improved impact-peel strengths at 23°C as well as -40°C . Consequently, the coexistence of two components, CSR and flexible epoxy, in adhesive compositions played key roles in improving impact-peel strengths at room and low temperatures. As long thermoplastic chains are incorporated into epoxy backbones to form flexible epoxy, phase separations are observed upon curing. However, as the amount of catalyst increases, the phases become co-continuous in the cured flexible epoxy systems.