

## Kinetics measurement of polyurethane polymerization reaction through thermal and FT-IR analyses

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Catalytic mechanism of commercial curing agent for polyurethane reaction of hydroxyl-terminated polybutadiene (HTPB) and Isophorone diisocyanate (IPDI) was investigated by triphenyl bismuth (TPB) and dibutyltin dilaurate (DBTDL). The on-set temperature for curing of polyurethane reaction was characterized by the differential scanning calorimetry (DSC) and the activation kinetics were analyzed through the different scanning rates (2, 5, 10, 20 and 50 °C/min). FT-IR curing analysis and viscosity analysis were also performed according to the reaction time. During the polyurethane reaction of HTPB-IPDI, the soft and light curing reaction with non-catalyst were taken place at around 160~180 °C. The curing temperature for polyurethane reaction with commercialized TPB and DBTDL catalysts were 100~160 °C for soft curing. Therefore, it can be found that the curing temperature ( $T_p$ ) can be decreased by the addition of catalysts.