

## Synthesis and thermal properties of glycidyl azide polymer based polyurethane

김정수, 이동선, 권정옥<sup>1</sup>, 노시태<sup>2,\*</sup>  
한양대학교 정밀화학공학과; <sup>1</sup>한양대학교 화학공학과;  
<sup>2</sup>한양대학교  
(stnoh@hanyang.ac.kr\*)

Energetic thermoplastic elastomers contain polymer chain with highly energetic moiety such as azide ( $-N_3$ ) and nitrate ( $-NO_3$ ), which release high energy due to the exothermic scission. These elastomers have been studied and developed as a new generation binder for propellants and explosives.  $\alpha, \omega$ -hydroxyl telechelic glycidyl azide polymer (GAP), which is one of the energetic binders, can react with isocyanates materials resulting in GAP-based polyurethanes. Thermosetting GAP-based polyurethanes had been researched. But the polyurethanes have some disadvantage that is not able to recycle. Otherwise thermoplastic GAP-based polyurethanes are recyclable. But GAP has secondary  $-OH$  groups that have less reactive than  $H_2O$ . so the synthesis of GAP based thermoplastic polyurethane required fine controlled condition.

In this study, thermoplastic GAP-based polyurethanes are synthesized and investigated the thermal properties of the GAP-based polyurethanes.