

Synthesis of Poly (glycidyl 2-ylidene-acetate) and Functionalization by Nucleophilic Ring-Opening Reactions

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Abstract: Novel poly(glycidyl 2-ylidene-acetate) (PGA) was successfully synthesized by Rhodium mediated C1 polymerization of glycidyl 2-diazoacetate. PGA is considered as the first functional polymethylenecapable of undergoing controlled post-polymerization modification by nucleophilic epoxide ring-opening at moderate reaction conditions, once treated with various amines and thiols. Even the bulky nucleophiles such as α -aminodiphenylmethane was found to react quantitatively, and yielded densely packed functional polymers. Unexpected outcome was discovered when post functionalization was performed in comparison with a well-known conventional epoxide-bearing C2 polymer, poly(glycidyl methacrylate) (PGMA). Reacting with primary amines under the same conditions, PGA favorably gave soluble products whereas PGMA resulted in gelation.

Keywords: C1 polymerization, post-polymerization modification, epoxide, thiol, amine

References

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