Glycidyl Methacrylate

Subjects: Polymer Science

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Glycidyl Methacrylate is a methacrylate monomer carrying a pendant epoxide ring, which makes it a handle for both radical polymerisation and post-polymerisation epoxy chemistry [1]. Grafted from cellulose by RAFT-mediated polymerisation, it installs epoxy groups on the polysaccharide backbone [1]. Grafting poly(glycidyl methacrylate) onto alumina particles and crosslinking the chains raises the thermal conductivity of the resulting epoxy composite [2]. Combining atom transfer radical polymerisation with anionic ring-opening polymerisation converts the epoxide into a polyether block, giving poly(glycidyl methacrylate)-g-dimethylsiloxane [3]. Melt grafting onto polypropylene is moderated by tea polyphenols, which limit radical side reactions [4]. Statistical, gradient and block copolymers with alkyl methacrylates have been prepared by nitroxide-mediated polymerisation, fixing the epoxide content per chain [5].

epoxide monomer | epoxy resin | grafting | raft polymerization | compatibilizer | functional monomer

References

1. Barsbay, M.; Kodama, Y.; Güven, O. Functionalization of cellulose with epoxy groups via γ-initiated RAFT-mediated grafting of glycidyl methacrylate. *Cellulose* **2014**, *21*, 4067-4079. [CrossRef]
2. Lee, W.; Wie, J.; Kim, J. Enhancement of thermal conductivity of alumina/epoxy composite using poly(glycidyl methacrylate) grafting and crosslinking. *Ceramics International* **2021**, *47*, 18662-18668. [CrossRef]
3. Satti, A.J.; Murano, P.I.R.; Pérez, C.J.; Freitas, A.; Giacomelli, C.; Ciolino, A.E. Anionic ring-opening polymerization following atom transfer radical polymerization: Poly(glycidyl methacrylate-g -dimethylsiloxane) obtained by " grafting from " strategy. *Polymer Engineering & Science* **2025**, *65*, 1424-1432. [CrossRef]
4. Zheng, X.; He, L.; Yu, G.; Li, Y. Effect of Tea Polyphenols on the Melt Grafting of Glycidyl Methacrylate onto Polypropylene. *Polymers* **2022**, *14*, 5253. [CrossRef]
5. Tajbakhsh, S.; Hajiali, F.; Marić, M. Epoxy-based triblock, diblock, gradient and statistical copolymers of glycidyl methacrylate and alkyl methacrylates by nitroxide mediated polymerization. *Reactive and Functional Polymers* **2021**, *167*, 105008. [CrossRef]

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