PHOTOSENSITIVE COVALENT ADAPTABLE NETWORKS FOR SURFACE FEATURES

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Abstract

Covalent adaptable networks (CANs), are thermoset polymers that incorporate dynamic covalent bonds to allow for the rearrangement of network topology, therefore enabling processes including stress relaxation, self-healing, and recycling. Photoresponsive dynamic moieties, such as allyl sulfides, enable spaciotemporal control over these effects. Kloxin et al. leveraged this feature to pattern surface topology by applying strain to elastomeric networks and subsequently activating localized stress relaxation, therefore thinning the region of interest.[1] This work builds on the mechanophotopattering process by developing methods for controlling the properties and patterns of smaller features than previously explored. Specifically, seeking to understand the analogue response of surface features to discreetly control size and structure; thereby enabling the production of complex and precise topographical designs.

References

1. Kloxin, C. J.; Scott, T. F.; Park, H. Y.; Bowman, C. N. Advanced Materials 2011, 23 (17), 1977–1981.