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Full Paper

Urethanes as reversible covalent moieties in self-healing polymers

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Abstract:

For the first time, reversible covalent urethane units are used for the design of new self-healing polymers. For this purpose, an electron-poor diol was synthesized and utilized as crosslinker to create a dynamic polymer network. Therefore, the diol, butyl methacrylate as well as 2-isocyanato ethyl methacrylate are intermixed and photo-polymerized in a bone-shaped PTFE mold. The resulting test specimens are characterized by DSC, TGA and DMTA and the self-healing behavior is studied using tensile tests. Thereby, healing efficiencies of up to 85% could be reached while the material exhibits good mechanical properties with high

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