

## Stress relaxation through dynamic covalent exchange in polyanhydrides

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Polyanhydrides are of interest in biomedical applications due to their biocompatibility and linear erosion. This makes them ideal for drug delivery systems. We are also interested in other applications of polyanhydrides such as shape memory and self-healing materials. Previous work in our groups investigated a shape memory elastomeric composite with a polyanhydride permanent phase. The dynamic covalent exchange that occurs between the anhydride groups at elevated temperatures complicated shape memory behavior. The exchange caused stress relaxation in the network, which although this allowed the permanent shape of the polymer to be reconfigured it meant that shape memory behavior was not optimal. It is therefore important to study the exchange process in order to facilitate either shape memory or self-healing in polyanhydrides. In this work, stress relaxation in polyanhydrides made using radical-mediated thiol-ene polymerizations was measured to determine the effect of the crosslink density and temperature on the exchange. Furthermore, a non-composite polyanhydride was investigated as shape memory material and evaluated for its adhesive properties.

