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Synthesis and shape memory study of amino acid-based polyurethane

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Polyurethane is widely used due to its high strength, high elasticity, wear resistance and oil resistance. Polyurethane synthetic leathers, polyurethane foams, polyurethane coatings, polyurethane adhesives, urethane rubbers (elastomers) and polyurethane fibers are very common products. However, with the depletion of petroleum resources, the development of new bio-based polyurethanes is imperative. We successfully synthesized a new type of amino acid-based polyurethane. First, amino acid-based polyester diols are prepared by chemical synthesis, followed by prepolymerization with lysine diisocyanate and finally lysine ethyl ester is added for chain extension to obtain amino acid-based polyurethanes. We also studied the shape memory behavior of the resulting material. This study not only provides new design ideas for biomaterials, expands its development direction, but also helps to improve the establishment of shape memory theory systems and lays a solid theoretical foundation for the further development of bio-based shape memory polymer materials.

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