The Synthesis and Characterization of Tulipalin A based Hydrogels

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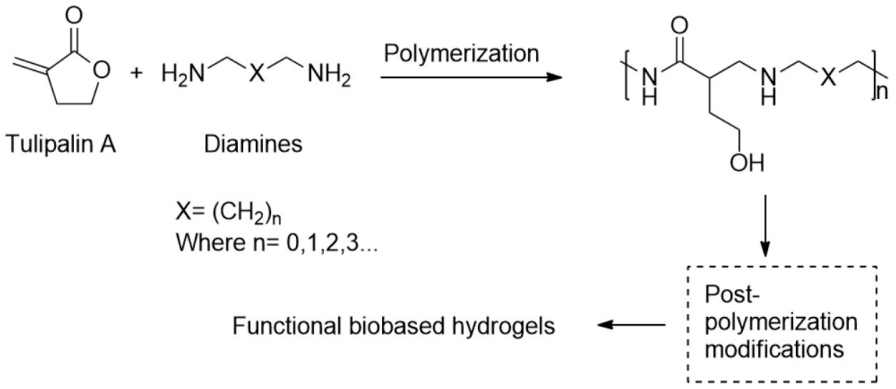
Poly(amidoamine)s or PAAs are polymers synthesised through the reaction of carbonyl group with amines. These types of polymers can be modified based on the application requirements; one such example is hydrogel synthesis.[1] Hydrogels are three-dimensional hydrophilic polymer networks extensively swollen with water.[2] They have many applications and are highly beneficial. One of the major disadvantages of these PAAs are their fossil-based origins. One such way to avoid those is to use biobased or renewable monomers for the polymerization. Renewable monomers sourced from plants and bio-feedstocks can be used as a suitable substitute for the synthesis of chemicals, building blocks, and biopolymers in this context.[3]

In the present work, novel hydrogels were synthesized by post-modification of a bio renewable Tulipalin A (α-methylene-γ-butyrolactone or MBL)- based polymer. This involves the polyaddition step-growth polymerization of MBL and diamines, resulting in the formation of poly(amidoamine)s (PAAs), followed by post-polymerization modifications into hydrogels. Prepared hydrogels with various compositions were investigated for their swelling, morphology, cytotoxicity, mechanical, and thermal properties.



Keywords: Renewable Monomer, Polyaddition, Poly(amidoamine)s, Biobased Hydrogels

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