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Influence of Keratin on Epoxidized Linseed Oil Curing and Thermoset Performances

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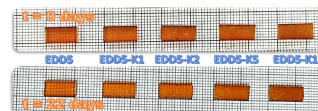
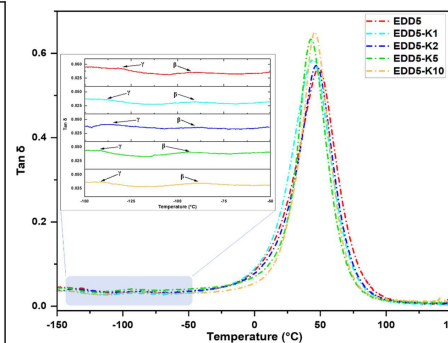
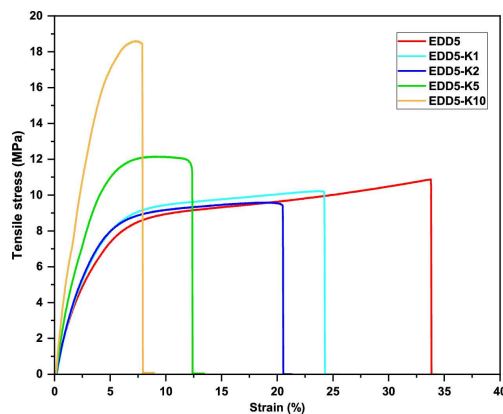
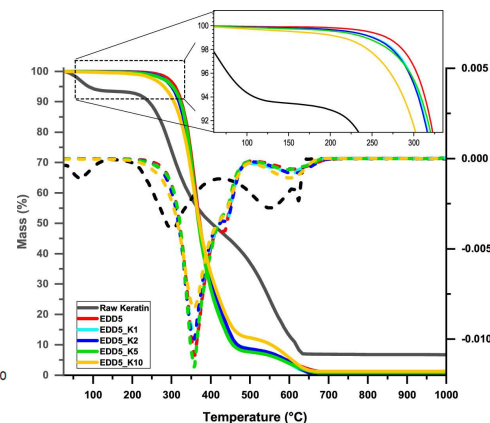
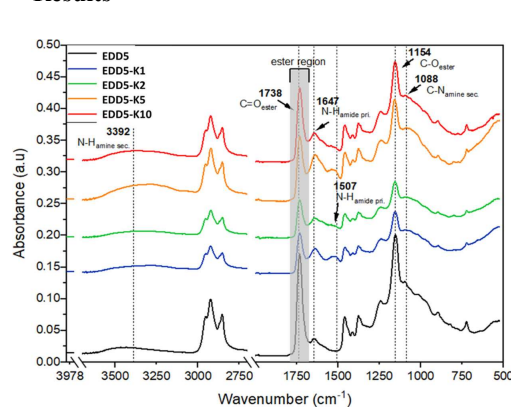


Abstract

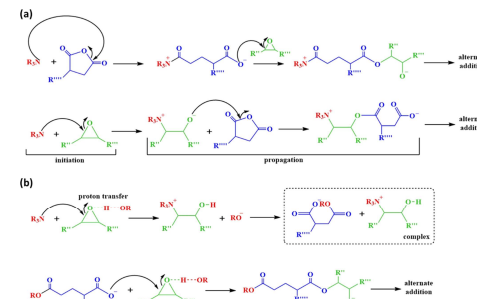
- The research explores the collaborative potential of keratin, a protein derived from chicken feathers, in combination with a biobased formulation containing epoxidized linseed oil (ELO) and dodeceny succinic anhydride (DDSA). Utilizing techniques such as differential scanning calorimetry (DSC) and in-situ Fourier transform infrared (FT-IR) spectroscopy, scientists examine how keratin affects the cross-linking process of ELO, shedding light on its chemical role in forming networks. Results indicate that keratin positively impacts several crucial aspects of the network, including its glass transition temperature, storage modulus, and tensile strength, suggesting that incorporating keratin enhances the material's overall performance and mechanical properties.
- Furthermore, the study highlights keratin's potential as a sustainable resource for producing commercially viable materials, particularly by repurposing waste from the food industry, such as chicken feathers. This research underscores the promising outlook of integrating keratin with biobased compounds like ELO and DDSA to develop sustainable materials with improved characteristics. By leveraging natural proteins in this manner, the investigation contributes to the development of environmentally friendly materials suitable for practical industrial applications.



Results



Experimental Scheme:



Conclusions

- Biobased resins with keratin from renewable and waste sources improved properties.
- Keratin addition boosted elasticity, stiffness, and hardness.
- Low water retention makes them ideal for diverse industrial uses as eco-friendly substitutes.

Acknowledgments

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