XLI CDCO

Società Chimica Italiana
Divisione di Chimica Organica

ROMA 10-14 Settembre 2023

XLI Convegno Nazionale della Divisione di Chimica Organica della Società Chimica Italiana

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Atti del Convegno

OC-10

Synthesis and Application of Bio-Based Materials from Soybean Oil

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Sustainability of synthetic chemistry processes and the use of eco-sustainable materials in a wide range of applications are hot topic of research.

The increasing demand of polymeric materials in combination to the interest in preventing environmental pollution recently brought to the design and synthesis of polymeric materials from sustainable feedstocks. Several efforts have been devoted to the synthesis of bio-based polymers via ring-opening metathesis polymerization from epoxidized soybean oil and its copolymerization.[1,2] While the polymerization of the crude soybean oil is less investigated, in this framework an easy conversion of soybean oil in a durable material is proposed.

Synthesis and characterization of the material by means of ^{1}H NMR, FT-IR and GC-MS of the derived methyl esters have been performed to shed light on the structural features of the material, while thermal stability and morphology have been analyzed via DSC and SEM investigations.

Finally, the obtained bio-polymer is chemical degradable and it can be efficiently applied for wastewater pollutant removal such as dyes, oil and halogenated solvents.

Figure 1: schematic representation of soybean oil polymerization.

References

[1] Z.Qian, S. Liu, G.Du, S. Wang, Y. Shen, X. Zhou, S. Jiang, H. Niu, Z. Duan, T. Li . *ACS Sustainable Chem. Eng.* **2023**, *11*, 5315−5324.
[2] W. Li, Q. Zhan, P. Yang., *ACS Sustainable Chem. Eng.* **2023**, *11*, 1200−1206.