Design, Synthesis of Biobased Chemically Recyclable Aliphatic Polyesters Prepared by Metathesis Polymerization 分解リサイクル可能なバイオベースポリマーの設計・創製とケミカルリサイクル Kotohiro Nomura, Tokyo Metropolitan University 東京都立大学 野村琴広

Aliphatic polyesters derived from plant resources attract considerable attention not only as alternative of petroleum-based polymers, but also in terms of circular economy. Olefin metathesis route consisting of acyclic diene metathesis (ADMET) polymerization and the subsequent hydrogenation has been considered as the synthetic route due to the wide polymer scope compared to the polycondensation

route. This paper focused on synthesis of biobased aliphatic polyesters prepared by ADMET polymerization and the subsequent hydrogenation,¹⁻³ in particular

synthesis of high molecular weight polyesters by adopting polymerization by molybdenum-alkylidene catalysts. The resultant polymer film exhibits better tensile properties (tensile strength and elongation break) than conventional polyolefins;⁴ the network polymers, prepared in the presence of glycerol based cross linkers, improved the elongation at break.⁵





Moreover, the resultant polyesters including conventional polyesters (PET, PBT etc. including textile waste) could be converted to monomers quantitatively by transesterification with alcohol in the presence of Cp'TiCl₃ (Cp' = Cp, C₅Me₅),⁶ or FeCl₃.⁷



In this seminar, we wish to present our results including our update data concerning synthesis new polyesters, poly(ester amide)s showing better tensile properties including relationship with the monomer repeating units. Details will be introduced in the symposium.

References

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