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Synthesis of high value chemicals from renewable resources via isomerization metathesis (isomet)

lefin metathesis is a powerful and versatile green method in synthetic organic and polymer chemistry. These reactions in general are very selective and require mild reaction conditions as well as low catalyst loadings. The atom economy of these synthetic procedures is often 100% indicating that all the starting materials are incorporated into the end products. Cross metatheses of a non-edible vegetable oil, the tung oil or α -eleostearic acid (ESA) methyl ester (1) with *cis*-1,4-diacetoxy-2-butene (2) using Hoveyda-Grubbs (3-HG2), Grubbs second or third generation catalysts (3-G2 or 3-G3), followed by Pd/C catalysed hydrogenation, gives methyl (ω) 11-acetoxy-undecanoate (4) as a polyester raw material, 1,6-hexanediol diacetate (5), the precursor of 1,6-hexanediol polyurethane monomer and heptyl acetate as a fragrance (6) in 51-99% yields. The onepot isomerisation of the isolated double bonds containing vegetable oils such as α -linolenic acid (ALA) methyl ester (7) using RuHCl(CO)(PPh3)3 catalyst followed by in-situ cross-metathesis (CM) of the reaction mixtures with 2 using 3-G2 leads also to the formation of 5 and the homologs of 4 and 6. Thus, in the latter approach, the key step of the synthesis of 5 is the one-pot isomerization of the isolated double bonds of 7 into conjugated ones in combination with a subsequent cross-metathesis using crosscoupling agent 2.

Biography

Robert Tuba has obtained his MSc (1998) and PhD (2003) degree's from University of Veszprem. After a Post-doctoral study at Eotvos Lorandt University, he joined the Research Group of Professor John A Gladysz at Friedrich Alexander University Erlangen-Numberg as an Alexander von Humboldt research fellow. From 2007, he was working at the GlaxoSmithKline Biologicals as a Process Development Supervisor. In 2011, he joined the Texas A&M University at Qatar as an Assistant Research Scientists. He was a Visiting Associate in Chemistry in California Institute of Technology at the Research Group of Professor Robert H Grubbs, in 2013. Currently, he is the Head of Green Chemistry Research Group at the Hungarian Academy of Sciences.

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