Synthesis of Bifunctional Monomers by the Palladium-Catalyzed Carbonylation of Cardanol and Its Derivatives

Author(S)
James E. Mgaya, Stuart A. Bartlett, Egid B. Mubofu, Q.A. Mgani, Alexandra M. Z. Slawin, Peter J. Pogorzelec, David Cole-Hamilton

Abstract
A 1,2-Bis(Di-Tert-Butylphosphinomethyl)Benzene-Modified Palladium Catalyst Has Been Used To Synthesize Bifunctional Monomers Of Different Chain Lengths From Cardanol. Short-Chain Derivatives Of Cardanol, Such As (E)-3-(Dodec-8-Enyl)Phenol; Hophc12-Ene, (E)-3-(Undec-8-Enyl)Phenol; Hophc11-Ene, (E)-3-(Dec-8-Enyl)Phenol; Hophc10-Ene, And 3-(Non-8-Enyl)Phenol; Hophc9-Ene, Were Synthesized By The Metathesis Of Cardanol With Symmetrical Internal Alkenes. These Derivatives Were Methoxycarbonylated To Produce Monomers With Different Chain Lengths Such As Methyl-16-(3-Hydroxyphenyl)Hexadecanoate; Hophc15coome, Methyl-13-(3-Hydroxyphenyl)Tridecanoate; Hophc12coome, Methyl-12-(3-Hydroxyphenyl)Dodecanoate; Hophc11coome, Methyl-11-(3-Hydroxyphenyl)Undecanoate; Hophc10coome, And Methyl-10-(3-Hydroxyphenyl)Decanoate; Hophc9coome, Respectively. Polymerization Of The Synthesized Monomers Produced Oligomers That Consist Of Up To Seven Monomer Units As Confirmed By MALDI-TOF-MS. Lactone Formation Was Also Observed In Some Cases Under Polymerization Conditions.