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Chemo-enzymatic synthesis and polymerizations of bio-based bisphenols derived from lignin: An access to novel 100% renewable alternating aromatic/aliphatic polymers

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Novel renewable bisphenols were prepared through chemo-enzymatic processes under mild conditions. The enzyme-catalyzed condensation steps have been optimized and lead to high purity grade bisphenols in high to excellent yields. The antiradical/antioxidant properties of these bio-based bisphenols were investigated and revealed activities similar or higher than that of current commercially available antiradical/antioxidant additives such as Irganox 1010. The bisphenols were then used as monomers for the preparation of various types of alternating aliphatic/aromatic polymers such as copolyesters, polyurethanes, poly(ester-alkenamers). The newly obtained homo- and copolymers were then characterized by NMR, GPC, DSC and TGA. These analyses revealed not only good thermal stabilities but also a broad range of accessible T_g. Linear phenolic homo-oligomers were also prepared through oxidase-mediated oligomerization; their thermal properties and antiradical activities were evaluated.

Biography

Florent Allais is currently a Full Professor in Chemistry at AgroParisTech and the Director of the Chair ABI (Industrial Agro-Biotechnologies) in Reims (France). He has completed his PhD from the University of Florida in 2004 and Post-doctoral studies in the group of Prof. Janine Cossy (ESPCI, Paris, France) and Dr. Jean Boivin (ICSN-CNRS, Gif-sur-Yvette, France). He has presented his research in numerous international conferences, published more than 30 papers in peer-reviewed journals, granted/filed 8 patents, served as reviewer of various journals and as Associate Editor of *Frontiers in Chemistry (Chemical Engineering)*.

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