

November 12-13, 2018  
Edinburgh, ScotlandYoussef Habibi et al., Trends in Green chem 2018, Volume 4  
DOI: 10.21767/2471-9889-C4-017

# New biopolymers from renewable building blocks derived from woody hemicelluloses

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**U**ntil recently the large majority of chemistry building-blocks are stemmed from petroleum resources. However, due to increasing scarcity of oil resources leading to a surge in raw materials prices combined to environmental concern and impact on human health, renewable and viable alternatives are urgently needed. In this purpose, the use of naturally-occurring and renewable building blocks for the chemistry in general and for the polymer science, in particular, is of great interest. Specifically, polysaccharides, such as cellulose and lignin, that are found in all plants cell are particularly good candidates for the replacement of fossil-based raw materials through their multifunctionality and are already considered as a versatile chemical platform. Among these interesting sources of raw materials, hemicelluloses represent 15% to 35% of plants and wood but is nevertheless an underexploited source of bio-based building blocks due to difficult extraction from the cell wall. Furthermore, a great majority of the extracted hemicelluloses are low-molecular-weight oligomers and cannot be valorized as such. In the present work, we relate the

use of low-molecular-weight hemicelluloses as a renewable building-block and its use for the design and the synthesis of new biopolymers through chain extension. Molecular, thermal and thermo-mechanical characterizations of the obtained polymers will be detailed.

## Biography

Youssef Habibi received his PhD in Organic Chemistry from Joseph Fourier University, Grenoble, France prepared jointly with CERMAV. He is working at the Luxembourg Institute of Science and Technology (LIST) as Lead Scientist. He works across many branches of the sustainable production of materials from renewable resources. His research interests include the design of new bio derived polymers; the development of high-performance nanocomposites from lignocellulosic materials, including natural nanosized fillers; biomass conversion technologies; and the application of novel analytical tools to biomass. He has published over 100 research articles or invited reviews in high-standard peer-reviewed journals and (co)edited and/or (co) authored several books and book chapters.

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