

## UniSysCat - Colloquium

Prof. Dr. ir. Bert F. Sels

Catholic University Leuven

Start Time: Wednesday, January 11, 2023 05:15 pm

End Time: Wednesday, January 11, 2023 06:30 pm

C 264  
and via Zoom

### **Reductive Catalytic Fractionation Lignin Oil: A Lignocellulose Processing delivering Unique Lignin Oils for Chemicals and Materials Applications**

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Abundant lignocellulose may be an alternative feedstock to fuel the sustainable carbon market of chemicals and materials, provided its processing is economically and sustainably viable. Complete usage of every biomass component is, among other criteria, mandatory before biomass can be considered an alternative of today's carbon feedstock. While processing of lignocellulose to carbohydrates is practiced for years such as in the paper industry and biotechnology (e.g., second generation ethanol), useful usage of lignin seems more challenging. Despite lignin can be considered as alternative aromatic feedstock in relation to its original in planta polyphenolic molecular structure, its isolation usually modifies the structure into (sometimes insoluble) less reactive feedstock that is difficult to convert (selectively).

This lecture will present a new catalytic conversion technology (RCF, reductive catalytic fractionation) that combines fractionation and depolymerisation to isolate lignin from lignocellulose, and that avoids formation of large unreactive lignin derivatives, while catalysis tunes product yields and thus lignin oil composition. The crude lignin oil will be discussed with focus on the composition and molecular identification, as well as several potential applications (both chemicals and materials) will be presented. For the latter, attention will go to drop-ins but also use of biomass to produce non-toxic alternative chemicals will be highlighted. A final part will show the first steps into the upscale of the RCF technology.

Dr. Majd Al-Naji

Organizer