

CHARACTERISATION OF POLYMERS FROM RENEWABLE RESOURCES – CHALLENGES AND (SOME) SOLUTIONS

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In many cases, biorefinery products are complex mixtures containing biomass-derived biopolymers and their degradation products in different ratios, purity and modifications depending on origin, treatment, and purification level. Classical laboratory methods developed many years ago are often not fit-for-purpose in modern labs. The paper will discuss the specific needs in biorefinery and biopolymer analysis and provide approaches to solve some of these problems by methods designed to cope with the peculiar features of lignocelluloses.

Molar mass analysis of polymers derived from renewable resources is challenged by their structural complexity. The traditional molar mass analysis approach - size exclusion chromatography (SEC) - is often hard to implement for lignocellulosics due to the necessity of additional sample purification procedures or solubility problems. The presence or sole analysis of oligomers and low molar mass degradation products as a result of degradation processes in a modern biorefinery often complicates the analytical approach.

Hence, methods like SEC-MALLS, asymmetric flow field-flow fractionation (AsFIFFF), Advanced Polymer Chromatography (APC) or High Performance Thin Layer Chromatography (HPTLC) offers solutions for some of the problems indicated above and will be discussed in the context of biopolymer characterization.

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