

Title (8)	:	Lignin Fractionation from Oil Palm Biomass Using Deep Eutectic Solvent as a Carbon Fibre Precursor
Journal	:	Advanced Structured Materials
Document Type	:	Book chapter
Publisher	:	Springer
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Link to Full Text	:	https://link.springer.com/chapter/10.1007/978-3-031-56844-2_24
Link to Scopus Preview	:	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85200579815&doi=10.1007%2f978-3-031-56844-2_24&partnerID=40&md5=0b412544196e1a6fbb36e4f22a9836de
Abstract	:	Deep eutectic solvents (DES) have emerged as a notable generation of environmentally benign solvents with properties similar to those of ionic liquids and organic solvents due to their minimal cost, high extraction efficacy, and technologically relevant capabilities. Pretreatment with DES is a viable option for removing biomass recalcitrance and increasing cellulose and lignin valorisation. DES can solubilise lignin from lignocellulose biomass and impart advantageous properties to the extracted lignin, such as precursors for carbon fibre production. However, the mechanisms of lignin-carbohydrate complex cleavage and lignin fractionation in lignocellulosic biomass are poorly understood. Furthermore, there has been limited investigation into the mechanism by which DES cleaves interlinkages in the lignin-carbohydrate complex structure. This is critical because the fundamental properties of isolated lignin determine its suitability as a carbon fibre precursor. This review aims to provide a new perspective on lignin extraction from lignocellulosic biomass using DES, with an emphasis on its potential as a carbon fibre precursor. The obstacles to tailoring lignin properties for various valorisation processes are also reviewed.