



Aerobic oxidation of β -O-4 lignin model compounds with solid catalysts

Melián Rodríguez, Mayra; Shunmugavel, Saravanamurugan; Kegnæs, Søren; Riisager, Anders

Publication date:
2015

[Link back to DTU Orbit](#)

Citation (APA):

Melián Rodríguez, M., Shunmugavel, S., Kegnæs, S., & Riisager, A. (2015). Aerobic oxidation of β -O-4 lignin model compounds with solid catalysts. Abstract from COST Action Meeting, Belgrade, Serbia.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Aerobic oxidation of β -O-4 lignin model compounds with solid catalysts

M. Melián-Rodríguez*, S. Shunmugavel, S. Kegnæs, A. Riisager

Centre for Catalysis and Sustainable Chemistry, Department of Chemistry
 Technical University of Denmark, Kemitorvet building 207
 DK-2800 Kgs. Lyngby, Denmark
 Email: mayro@kemi.dtu.dk

Introduction

The research interest in biomass conversion to fuels and chemicals has increased significantly in the last decade in view of current problems such as global warming, high oil prices, food crisis and other geopolitical scenario. In addition, special attention is giving to the conversion of lignocellulosic biomass, which does not compete with food resources and is widely available as a low cost feedstock [1].

Lignocellulosic biomass is a complex material composed of carbohydrate polymers (cellulose, hemicellulose) and an aromatic polymer (lignin). Lignin represents 40% of biomass energy content and it is mainly composed of three different monolignol monomers: *p*-coumaryl, coniferyl and sinapyl alcohol. These monomers are connected with various linkages with the most common one being the β -O-4 linkage [2-4].

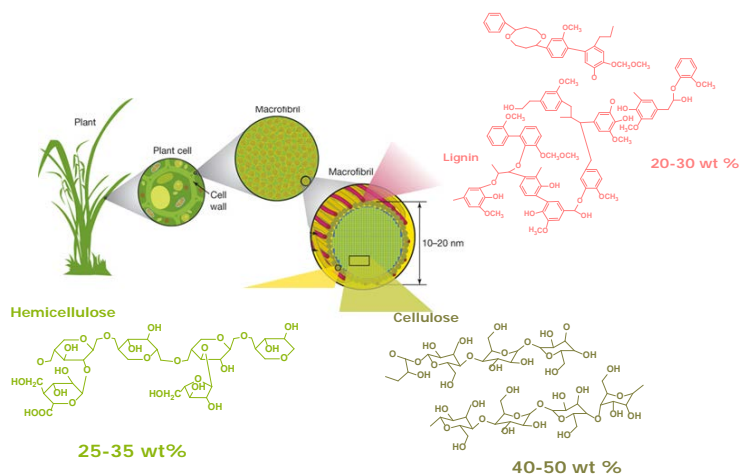


Figure 1. View of the role and content of lignin, cellulose and hemicellulose in a typical plant [2, 3].

The lignin structure is complex so different model compounds are often used to study lignin valorization. These model compounds contain the linkages present in lignin, simplifying catalytic analysis and present analytical challenges related to the study of the complicated lignin polymer and the plethora of products that could be obtained [2-5].

H. Lange et al. has reported that the catalytic oxidation products of lignin and lignin model compounds range from aromatic aldehydes and carboxylic acids and they originate from oxidation of side chains. The products obtained in these reactions are based on the severity of the reaction conditions [6].

Here, we present an overview of our recent research on the conversion of some lignin model compounds using heterogeneous catalysis in oxidation reactions.

Acknowledgements

The authors appreciate financial support granted to the International Network Programme (12-132649) from The Danish Agency for Science, Technology and Innovation, Haldor Topsøe A/S and the Technical University of Denmark.

References

- [1] P.T. Patil, U. Armbruster et al., *Energy Fuels*, 25 (2011) 4713.
- [2] J. Zakzeski, P.C.A. Bruijninx et al., *Chem Rev*, 110 (2010) 3552
- [3] R.J.A. Gosselink et al., *Bioresour. Technol.*, 106 (2012) 173
- [4] P. T. Patil et al., *Energy Fuels*, 25 (2011) 4713
- [5] Q. Xiang, Y.Y. Lee, *Appl. Biochem. Biotechnol.*, 153 (2000) 84
- [6] H. Lange et al., *Eur. Polymer J.*, 49 (2013) 1151