

Renewable Resources: Opportunities provided by the valorization of biomass, carbon dioxides and renewable electrical energy

Prof. Dr. Regina Palkovits

Institut für Technische und Makromolekulare Chemie, RWTH Aachen University,
Worringerweg 2, 52074 Aachen, Germany; e-mail: palkovits@itmc.rwth-aachen.de

Renewable carbon feedstocks such as biomass and CO₂ present an important element of future circular economy. Especially biomass as highly functionalized feedstock provides manifold opportunities for the transformation into attractive platform chemicals. However, this change of the resources requires a paradigm shift in refinery design. Fossil feedstocks are processed in gas-phase at elevated temperature. On the contrary, biorefineries are based on processes in polar solvents at moderate conditions to selectively deoxygenate the polar, often thermally instable and high-boiling molecules. Considering “green electrons” provided by renewable energy technologies, also electrocatalytic processes become attractive as possible technology of a throughout circular economy. Herein, challenges of catalytic biomass valorization, CO₂ activation as well as opportunities provided by electro-catalysis and the interface to biotechnology will be discussed.

References

- [1] Delidovich, I., Leonhard, K., Palkovits, R., *Energy Environ. Sci.* **2014**, 7, 2803.
- [2] Hausoul, P., Broicher, C., Vegliante, R., Göb, C. Palkovits, R., *Angew. Chem. Int. Ed.* **2016**, 55, 5597.
- [3] J. Holzhäuser, J. Artz, S. Palkovits, D. Kreyenschulte, J. Büchs, R. Palkovits, *Green Chem.* **2017**, 19, 2390.