DEVELOPMENT OF A HIGHLY ACTIVE PROLINE-BASED ZINC CATALYST FOR CO_2/EPOXIDE COPOLYMERIZATION

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The pursuit of sustainable processes and products is one of the most important challenges of recent times and will likely receive even more attention in the coming years. This arises not only from the goal of creating a more environmentally friendly industry, but also to become less dependent on fossil fuels. To tackle both problems, the use of CO_2 as a sustainable nontoxic C_1-building block is of growing interest.[1]

One of the many possibilities for the usage of CO_2 is its copolymerisation with epoxides to form polycarbonates.[2] This reaction allows the incorporation of up to 50 wt% of CO_2 in the final polymer using ethylene oxide, and it also allows the use of regenerative epoxides like limonene oxide or pinene oxide.[3,4]

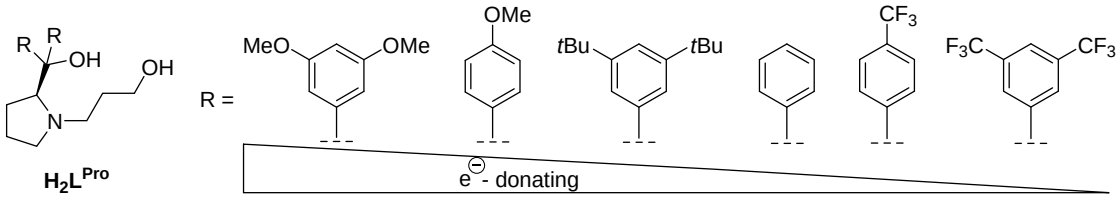

Figure 1: *L*-Prolin based ligand H_2L^{Pro} with its different phenyl-substituents**.**

In this work the synthesis and spectroscopic characterization of a series of *L*-prolin based {ONO} ligands and their corresponding zinc(II) complexes will be described; these represent variations of the recently reported, highly active CO_2/epoxide copolymerization catalyst with the parent ligand (R = Ph).[5] Catalytic screening of the complexes allowed to investigate the influence of the electronic properties of the ligand substituents on the copolymerization activity and chemo- as well as stereoselectivity.

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[3] Hauenstein, O.; Reiter, M.; Agarwal, S.; Rieger, B.; Greiner, A. Green Chem. 2016, 18, 760–770.

[4] Robert, C.; De Montigny, F.; Thomas, C. Nat. Commun. 2011, 2, 1–6.

[5] Schütze, M. Dechert, S.; Meyer, F. Chem. - A Eur. J. 2017, 23, 16472–16475.