Novel Guanidine-Quinoline Hybrid Ligands and the Application of their Zinc Complexes in Lactide Polymerisation

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\textit{Dedicated to Professor Wolfgang Beck on the occasion of his 80\textsuperscript{th} birthday}

The syntheses of the three new guanidine-quinoline hybrid ligands TMG\textsubscript{mqu}, DMEG\textsubscript{mqu} and TMG\textsubscript{t}bqu are reported. Zinc chlorido and triflato complexes with these ligands were obtained and structurally characterised by X-ray crystallography. In the chlorido complexes the zinc atom is co-ordinated by two chlorido ligands and the bidentate guanidine ligand in a distorted tetrahedron. Using zinc triflato, tetrahedral bis(chelate) complexes are formed, and the triflato anions serve only for charge compensation. All reported complexes show activity in the polymerisation of \textit{rac}-lactide, with the chlorido complexes only showing a poor activity. With the bis(chelate) triflato complexes a high polymerisation activity with a slight heterotactic bias was observed. Kinetic studies reveal a first-order chain growth reaction for the lactide polymerisation with all complexes.

\textit{Key words:} Guanidine Hybrid Ligands, Zinc Complexes, Lactide Polymerisation