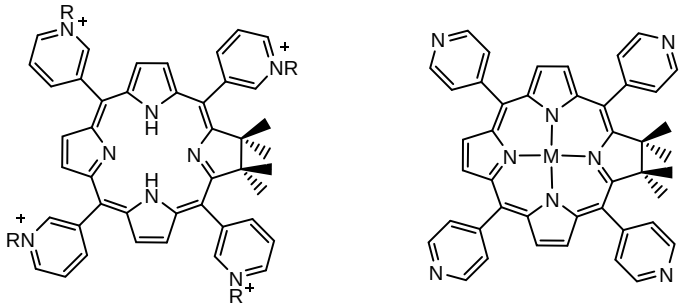
Advanced red-light harvesting photosensitizers based on 2,2′,3,3′-tetramethyl-meso-(pyridyl)chlorins

Ali Tuna, Günther Knör

Institute of Inorganic Chemistry, Johannes Kepler University, 4040 Linz, Austria

Chlorins [1] are visible-light absorbing N_4-macrocyclic ligands carrying an aromatic 18π-electron system and one saturated β-pyrrole double bond. This type of tetrapyrrole ligand structure is also common to the natural chlorophylls, which represent the most abundant class of porphyrinoid pigments on earth. In the case of chlorins derived from 2,3-dihydroporphyrins, aerobic oxidation of the saturated β-pyrrole position may occur, which leads to a loss of the enhanced red-light harvesting properties of the compound.



In our current study, we therefore employed novel synthetic approaches to the synthesis of various 2,2,3,3-tetra-substituted and thus more oxidation resistant chlorin and metallochlorin derivatives such as those depicted above. These new systems are characterized by different spectroscopic techniques (UV-Vis, NMR, ESI-MS) and their photophysical properties are investigated. Furthermore, the compounds obtained will also be tested for their potential photocatalytic reactivity in the context of artificial photosynthesis, solar-driven biomimetic chemistry and molecular photomedicine [2-4].

---

[1] Borbas, *Handbook of Porphyrin Science* **2016**, volume 36, chapter 181 – Chlorins.

[2] Knör, G. et al., *Inorganic Chemistry* **2013**, 52, 11910.

[3] Knör, G. et al., *Physical Chemistry Chemical Physics* **2017**, 19, 8141.

[4] Knör, G. *Coord. Chem. Rev.* **2016**, 325, 102.