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Synthesis of new heterobimetallic (Ru/Re) complexes for CO release

Samuel Peterer

The mission of this Master thesis was to attempt to synthesize a heterobimetallic complex composed of three parts. On the one side of the molecule rests the photosensitizer ruthenium (Ru) and on the other lays the carbonyl-releasing rhenium (Re). Both metals are connected together via a bis-bipyridine type ligand. The finality of connecting these two metals can be summarized as followed. Ruthenium is a very good singlet oxygen generator as it absorbs light and transmits the energy to the surrounding oxygen. The latter will be effective in disrupting the rhenium-carbonyl bond and thus releasing the CO. This feature is already well known and studied for its cytotoxic property, for example in cancer treatment. Using rhenium compounds for CO release has many advantages, but mostly, after CO exits the complex, perrhenate arises through oxidation and hydrolysis which doesn't affect the human body in any toxic way.

Prof. Dr. Fabio Zobi