

FIRST ROW TRANSITION METAL MABIQ COMPLEXES AS (PHOTO)CATALYSTS FOR SMALL MOLECULE CHEMISTRY

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Inorganic photocatalysts are essential to the development of artificial photosystems and the concomitant generation of solar fuels. As part of our efforts to generate new earth-abundant photocatalysts, we have developed a series of mono- and bimetallic complexes, based on a macrocyclic biquinazoline ligand, Mabiq. The series includes complexes with formal oxidation states ranging from 0 to +3. The monometallic Co(II) complexes are able to evolve hydrogen upon reaction with proton sources under electrocatalytic conditions. The divalent metal-Mabiq complexes can be photoreduced to the formally monovalent forms, in the presence of appropriate sacrificial donors. Spectroscopic and DFT computational methods provide insight into the electronic structure, photochemical properties and reactivity of the compounds.