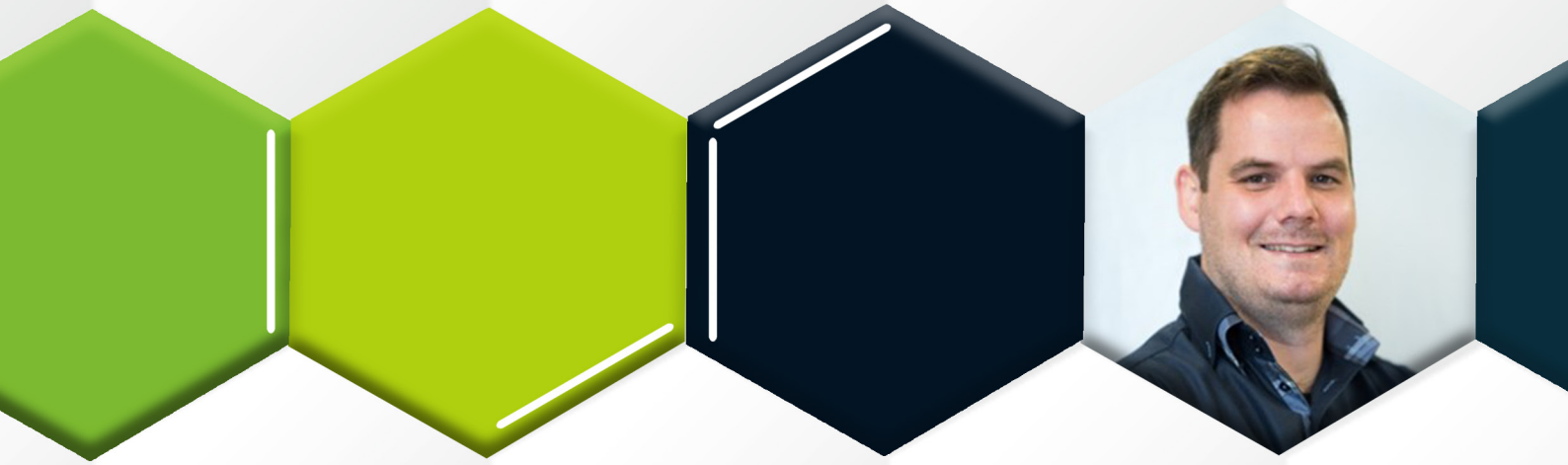
EuroTech Seminar

Noble Metal Like Catalysis with Iron: One Carbon Atom Makes All the Difference



7 July 2021

15:00-16:00 CET
Zoom link:
https://us02web.zoom.us/j/85946790723

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The continuous effort to present a more sustainable outlook for future generations has led to a renaissance in the use of earth-abundant metals in homogenous catalysis. Their natural abundance, low-toxicity, and ready availability have been strong incentives to replace their less environmentally friendly noble metal counterparts. In addition, the smaller ionic radii, and typically high-spin electronic structure have resulted in unique reactivity that can be otherwise hard to realize with their heavier congeners. Nonetheless, there are only a few examples of earth-abundant metal catalyst that can achieve noble-metal like reactivity. In this lecture, we will review earth-abundant metal ligand design and demonstrate how the addition of one carbon atom can make all the difference between a mediocre and an excellent catalyst. We will use our recently developed $PC_{NHC}P$ iron complexes as example where we will also explore the effect of oxidation and spin-state on the reactivity of these complexes in a variety of transformations including in alkene isomerization, C–H bond activation, and in hydrogen isotope exchange.