

ICB PhD public presentations**PALLADIUM-PHOSPHINE-MOFs
AS MOLECULARLY DEFINED
HETEROGENEOUS CATALYSTS
FOR CROSS COUPLING
REACTIONS****Daniele Cartagenova**

The van Bokhoven Group

Supervisor: Prof. Dr. Jeroen A. van Bokhoven

Co-examiners: Prof. Dr. Bill Morandi (LOC),
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**31/03/2022, 1 pm, HIT H12 / PSI OFLG/402 on
Zoom: Meeting ID: 322 583 2258**

Project Summary: Cross coupling reactions are fundamental tools in the synthesis of small molecules. Suzuki-Miyaura cross coupling is widely used in large scale production of drug substances. The use of homogeneous palladium catalysts results in metal contamination in the final products, that need to be removed in time- and solvent-consuming purification steps. Heterogeneous catalysts have the potential to overcome this problem and allow recycling of the precious metal. However, they demonstrate in general low activity and often do not convert complex substrates. Metal-organic frameworks (MOFs) functionalized with phosphine groups were used to prepare molecularly defined heterogeneous palladium catalysts. Their high activity and selectivity in Suzuki-Miyaura cross couplings were demonstrated in mild reaction conditions. The presence of molecular palladium-phosphine sites was correlated with selective cross coupling and that of palladium nanoparticles with side-reactions. MOF immobilization reduced the catalyst residues by one order in magnitude without compromising the catalytic performance.

CV: Daniele received his BSc (2015) and MSc (2018) in Chemistry from University of Genova (IT). He started his PhD in the van Bokhoven group in July 2018.