

***Functionalisation of C-H Bonds:
The Strength of Ruthenium (II) Catalysts***

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Professional career



Pierre H. Dixneuf initially studied ferrocene chemistry with René Dabard (Doctorate, 1971, Rennes) and N-Heterocyclic Carbene NHC metal complexes with Michael F. Lappert (Brighton 71-72). Professor in Rennes since 1978, his interests focused first on organometallic chemistry: conjugated carbon-rich system, vinylidene- and allenylidene-ruthenium complexes. Then he moved from 1985 on to homogeneous catalysis especially with ruthenium catalysts: C-C bond formation from alkynes via oxidative couplings, vinylidenes in catalysis for anti-Markovnikov additions to alkynes, and alkene metathesis with allenylidene- and indenylidene-ruthenium catalysts and for the transformation of plant oils into industrial precursors. Since 2008 he is an Emeritus Professor and investigates C-H bond functionalization with ruthenium(II) catalysts including metal-catalysis in water. He has been the head of Rennes CNRS-University research unit on organometallics and catalysis (86-99), research advisor at CNRS chemistry headquarters (96-99) and at the university of Rennes (00-04) where he set up the research institute of chemistry in 2000. He was Humboldt research laureate in 1991 and worked 6 months at F-U Berlin. He is the recipient of Le Bel Prize (SCF 2000) Grignard-Wittig prize (GDCh 2001), Sacconi medal (Italy, 2006) and IFP-Académie des Sciences grand prix (2006).

Research Interests

The current topic of research aims at the sp^2 C-H bonds activation and their catalytic functionalisation for cross-coupling reactions avoiding the use of one or two organometallic intermediates. The innovations deal with the use of unique ruthenium(II) catalysts, that are cheap and usually stable to air and water. These catalysts promote direct arylations with (hetero)aryl halides of functional arenes and heterocycles or dehydrogenative cross couplings from two different C-H bonds, with the help of carbonates and carboxylates as crucial catalyst partners allowing metal-catalysis in water.