

Royal Society of Chemistry Prize Lecture

Wednesday 8th February 2pm Ingram Lecture Theatre
Professor Andrew Weller, University of Oxford

Recipient of Royal Society of Chemistry Frankland Award

Awarded for significant and innovative contributions to the synthesis of, and catalysis with, organometallic complexes containing C-H or B-H sigma interactions, in particular transition metal alkane complexes and the dehydrocoupling of amine-boranes.

Solid-State Molecular Organometallic Synthesis and Catalysis

Abstract:

Organometallic Chemistry is dominated by structures, transformations and catalysis that occur in the solution phase. However, this is not always the most desirable phase to operate in. For example: when catalysis requires separation of catalyst and substrates/products, selectivity in transformations that is promoted by solid-state effects is required, when solvent reacts unfavourably with the metal complex or when the host-guest properties of crystalline lattices encourage the formation of complexes that are difficult to prepare in solution phase.

This talk will outline recent investigations that explore the use of cationic group 9 phosphine complexes in Solid-State Molecular Organometallic Synthesis and Catalysis (SMOM-systems). In particular the synthesis, solid-state characterisation (by single crystal X-ray diffraction, power diffraction, solid-state NMR spectroscopy) and onward reactivity of transition metal alkane complexes will be discussed. It will be shown that by careful manipulation of the steric and electronic environment around the metal centre, and control of the thermodynamics/kinetics leading to onward reaction, a number of alkane coordination complexes can be readily synthesized, some of which show remarkable stability on the solid-state. Their use in C-H activation processes and catalysis is discussed.

Biographical information:

Andrew Weller is a Professor of Chemistry at the University of Oxford and a fellow of Magdalen College. He moved to Oxford in 2007, after starting his independent career at the University Bath in 1999 as a Royal Society University Research Fellow. He completed his first degree at the University of Warwick, a PhD at Bristol (advised by Dr John Jeffery), and PDRA positions at Heriot-Watt (Professor Alan Welch) and Notre Dame (Professor Tom Fehlner).

Weller was the recipient of the inaugural Dalton Transactions European Lectureship award 2008. He was a 2013/2014 Peter Wall Institute for Advanced Studies Visiting Scholar, UBC, Canada; in 2015 the Howard Fellow, University New South Wales, Australia, a visiting Professor at the University of Perugia, Italy and a Vielberth Fellowship at the University of Regensburg (2016). He is a currently holder of an EPSRC Established Career Fellowship (2015–2020) and was recipient of the Royal Society of Chemistry Frankland award in 2016.

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