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Ruthenium complexes for catalysis and therapy

James W. Walton
Department of Chemistry, Durham University, South Road, Durham

We have shown the first example of catalytic S_NAr of unactivated aryl chlorides (see Chem Commun 2015, p276). Experimental evidence indicates that our method proceeds via an η^6-coordination mechanism with yields up to 90%. The rate determining step of this reaction is exchange of the η6-boud product for arene starting material. We have designed and synthesised novel Ru complexes that accelerate the rate of arene exchange by up to 18X.

We have also developed a series of Ru arene complexes as potential anticancer agents. We have probed the aqueous behaviour of these complexes and compiled toxicity data. Finally, we have developed a series of histone deacetylase inhibitors. This series of compounds is effective in inhibiting proliferation of ovarian cancer cells. In some cases, the compounds are selective towards cancer cell over healthy cells, whilst selected compounds show thermoresponsiveness.