

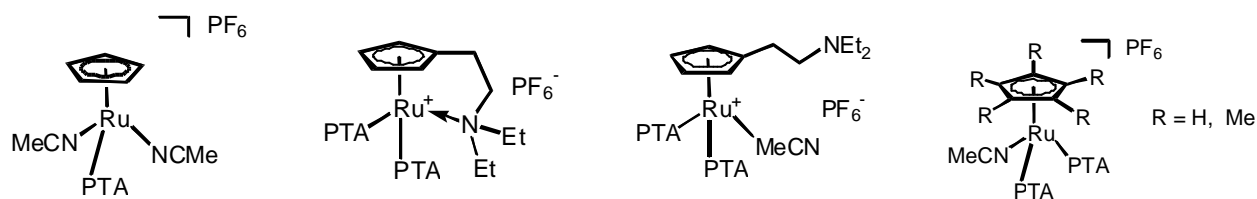
REGIOSELECTIVE HYDROGENATION OF BENZYLIDENE ACETONE AND CINNAMALDEHYDE CATALYSED BY WATER SOLUBLE RUTHENIUM COMPLEXES

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The replacement of organic solvents with water has attracted interest both from academia and industry, because of the lower environmental impact and the possibility to separate the products from the catalyst easily, allowing in principle for its efficient and cost-effective recycling.¹ The regioselective hydrogenation of α,β -unsaturated substrates is a reaction of high interest for the synthesis of pharmaceutical intermediates and has been successfully transferred to aqueous biphasic conditions.²

In this communication, we report a series of novel water soluble half-sandwich Ru-cyclopentadienyl derivatives containing the cage-like monodentate phosphine 1,3,5-triaza-7-phosphaadamantane (PTA) that have been synthesized and tested as catalysts for the regioselective hydrogenation of cinnamaldehyde (CNA) and benzylidene acetone (BZA). Under a pressure of hydrogen and mild conditions, all complexes have shown very high selectivity towards C=C hydrogenation.³ The best activity was exhibited by complexes $[\text{CpRuCl}(\text{PTA})_2]$ and $[\text{CpRu}(\text{MeCN})_2(\text{PTA})](\text{PF}_6)$ (76% conversion) while lower activity was shown by $[\text{Cp}^*\text{RuCl}(\text{PTA})_2]$ (21%). The opposite trend was observed under hydrogen transfer conditions, where Cp^* complexes are generally much more active than the Cp analogues. The regioselectivity of CNA hydrogenation is influenced mainly by the temperature in our systems.⁴



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