

## Abstract

The reaction of appropriate N,N-bidentate ligands with the  $[(\eta^6\text{-p-cymene})\text{Os}(\mu\text{-Cl})\text{Cl}]_2$  dimer, followed by metathesis reaction with  $\text{NH}_4\text{PF}_6$ , gave the new osmium(II) arene complex salts  $[(\eta^6\text{-p-cymene})\text{OsCl}(\text{C}_5\text{H}_4\text{N}-2\text{-CH}=\text{N}-\text{R})\text{PF}_6$ , where (R = tert-butyl (1), iso-propyl (2), 2, 6-dimethylphenyl (3) and 2,6-diiso-propylphenyl (4)). The dimer was also reacted with N,N'-bidentate ligands di-(2-pyridyl)amine (5), 4-phenyl-3,6-di(2-pyridyl)pyridazine (6), 4, 4'-ditert-butyl-2, 2'-bipyridine (7); 5, 5'-dimethyl-2, 2'-bipyridine (8). In addition, the reaction of the precursor  $[(\eta^6\text{-C}_6\text{H}_6)\text{Os}(\mu\text{-Cl})\text{Cl}]_2$  with the N,N'-bidentate ligands gave  $[(\eta^6\text{-C}_6\text{H}_6)\text{Os Cl}(\text{N}-\text{N})]_2$  where N-N = 4, 4'-ditert-butyl-2,2'-bipyridine (9); 5,5'-dimethyl-2,2'-bipyridine (10), 3,6-bis(2-pyridyl)-4-phenyl pyridazine (11) and di-(2-pyridyl)amine (12). The compounds were characterized using  $^1\text{H}$  and  $^{13}\text{C}$  NMR, UV-Vis, FT-IR and elemental analysis. The single crystal x-ray structures for compounds 1, 4, 8, 10 11 and 12 showed that the osmium(II) complexes adopted the classical three legged piano stool geometry. These osmium(II) compounds were found to be effective catalysts for the transfer hydrogenation of ketones into alcohols with NaOH as base and 2-propanol as the solvent and hydrogen source. A range of cyclic, aromatic and aliphatic ketones was studied, and good turnover numbers achieved.