Ruthenium (II) complexes in catalytic oxidation

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Ruthenium (II) complexes of the type RuL(CO)2Cl2, [RuL(CO)2L?2]2+ and [RuL(CO)2Cl L?]+ [L = bipyridine (bpy), phenanthroline (phen), biquinoline (biq) and L? = pyridine (py), 4-chloropyridine (Cl-py), 4-methoxypyridine (MeO-py)] were synthesized from [Ru(CO)2Cl2]n and L, to produce the intermediate RuL(CO)2Cl2, followed by hydrolysis and reaction with L?. The catalytic activity of these complexes in epoxidation of olefins with iodosylbenzene under ambient conditions was investigated. A possible mechanism of these reactions, explaining the effects of the ligands on the reaction was explored. At least one carbonyl ligand remained bound to the metal through the reaction. The formation of an oxo intermediate was inferred from spectroscopic detection of bridged oxygen Ru-O-Ru and Ru=O species.