E2-45 Complexes of an azine diphosphine with ruthenium

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The azine diphosphine (1) has the *Z,Z*-configuration around C=N bonds and it forms a trigonal-planar gold (I) complex containing a 9 membered chelate ring. But the energy barrier to rotation around a C=N bond is low and the diphosphine often coordinates in the *E,Z*-configuration as a (P-N-P) terdentate ligand. In this way it forms stable complexes with *fac*-arrangement with d^6 metal centres such as Cr(0), Mo(0) and W(0). Therefore it is of interest to investigate the coordination chemistry of the ligand (1) with group 8 metals.

The synthesis and properties of some chlorocarbonyl ruthenium (II) complexes of (1) are presented here - treatment of $[RuCl_2(CO)_2]_x$ with (1) (one equivalent per ruthenium atom) in 2-methoxyethanol at 120°C for 24h gave a yellow solution containing a mixture of products (^{31}P-{^{1}H} NMR evidence). When the reaction mixture was cooled the *fac,cis*-complex (2) deposited in an essentially pure state as a yellow solid in 29% yield. When the mother liquor of the above reaction mixture was put aside for 2 days the *mer,cis*-complex (3) crystallised out as a yellow solid in 26% yield. Irradiation of (3) in chloroform solution with a mercury are UV-lamp yielded (2) quantitatively. When a solution of (2) in 2-methoxyethanol was put aside at 20°C in daylight it rearranged to (3) with the *mer,trans*-complex (4) as a probable intermediate. In conclusion, chlorocarbonylruthenium(II) complexes (2) and (3) containing the *E,Z*-azine diphosphine were prepared with the ligand in the *fac*-and *mer*-arrangements, respectively, and the interconversion of these complexes was achieved photochemically.