

A Seven-co-ordinate Complex containing Tungsten-Mercury Bonds

By M. C. GANORKAR and M. H. B. STIDDARD

(William Ramsay and Ralph Forster Laboratories, University College, Gower St., London, W.C.1)

It has been demonstrated that complexes containing iridium-mercury linkages can be prepared by direct addition of mercury(II) halides to the square iridium(I) complex $\text{Ir}(\text{CO})(\text{PPh}_3)\text{Cl}$.¹ As part of a more general investigation of the reaction of mercury(II) halides with transition-metal carbonyl complexes, we have studied the reaction of mercury(II) chloride with the 2,2'-bipyridyl-substituted carbonyl $\text{W}(\text{CO})_4(\text{bipy})_2$ in acetone solution. Reaction occurs at room temperature with slow evolution of carbon monoxide, and addition of pentane produces the orange crystalline compound $\text{W}(\text{CO})_3(\text{bipy})(\text{HgCl})_2$ (73% yield),

which was crystallised from dichloromethane and dried *in vacuo*.^{*} The compound is diamagnetic, monomeric in dichloromethane, and a non-conductor in nitrobenzene. In its infrared spectrum in the C-O stretching region, bands are observed at 2000vs, 1924s, and 1887s cm^{-1} in chloroform. This spectrum is very similar to that of the seven-co-ordinate tungsten(II) complex $\text{W}(\text{CO})_3(\text{bipy})\text{I}_2$,² except that the bands occur at lower frequencies. This is consistent with the lower electronegativity of the -HgCl group.

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* (Found: C, 17.5; H, 1.5; Cl, 7.5; Hg, 44.3; N, 3.2; W, 20.2. $\text{C}_{13}\text{H}_8\text{Cl}_2\text{Hg}_2\text{N}_2\text{O}_3\text{W}$ requires C, 17.4; H, 0.9; Cl, 8.0; Hg, 44.8; N, 3.1; W, 20.5%.)

¹ R. S. Nyholm and K. Vrieze, *Chem. and Ind.*, 1964, 318.

² M. H. B. Stiddard, *J.*, 1962, 4712.