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A HYDRIDO DIOLEFIN COMPLEX OF IRIDIUM(III)

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Complexes containing hydrogen and an olefin bonded to the same metal atoms have been postulated as unstable intermediates in various catalytic reactions e.g. OXO syntheses (1), but have not hitherto been prepared. We now describe a hydrido cyclo-octa-1,5-diene complex of iridium(III) $[IrHCl_2(C_8H_{12})]_2$ prepared in 70% yield by heating an ethanol solution of chloroiridic acid with cyclo-octa-1,5-diene for 2 hr. It forms insoluble cream microcrystals decomposing $> 200^{\circ}$ without melting. The infrared spectrum shows a strong absorption band at 2261 $cm.^{-1}$ due to an iridium--hydrogen stretching mode, this shifts on deuteration to 1613 cm^{-1}. On treatment with diethylphenylphosphine this hydrido complex gives the hydrido complex $[IrHCl_2(PEt_2Ph)_3]$ (white isomer) (2). With sodium carbonate in methanol the methoxyl bridged iridium(I) complex $[Ir(OCH_3)(C_8H_{12})]_2$ is formed, this reaction is reversed by hydrochloric acid. Treatment of $[IrHCl_2(C_8H_{12})]_2$ with cyclopentadienylsodium gives the volatile cyclopentadienyl iridium(I) complex $[Ir(C_5H_5)(C_8H_{12})]$ and with thallous acetylacetonate the acetylacetonato-iridium(I) complex $[Ir(acac)(C_8H_{12})]$.

Further studies of olefin-iridium complexes are in progress.

REFERENCES

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