

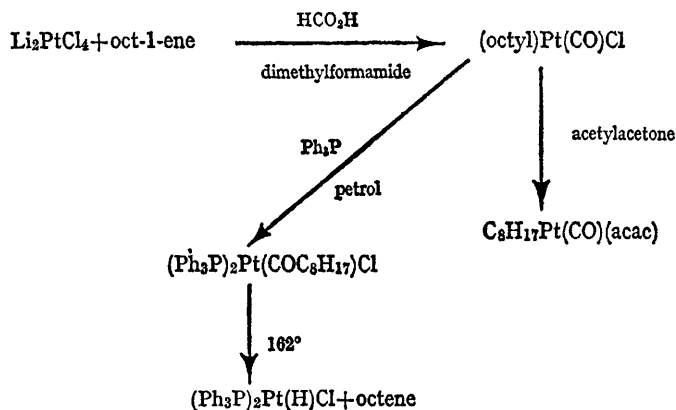
Alkylplatinum Carbonyl Chlorides

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A SIMPLE preparation of a novel class of transition-metal alkyl derivatives is reported. Lithium tetrachloroplatinate(II) dissolved in dimethylformamide is warmed with a mixture of oct-1-ene and formic acid and the resulting octylplatinum derivative can be extracted with isopentane in yields of 20–40%. The constitution of the

absorption at 720 cm.^{-1} indicated the presence of a long-chain alkyl group. The material yielded a crystalline acetylacetonate, $\text{C}_8\text{H}_{17}\text{Pt}(\text{CO})\text{C}_5\text{H}_7\text{O}_2$ in which the platinum-carbonyl and platinum-alkyl groups were retained. Proton magnetic resonance determinations on the acetylacetonate demonstrated the presence of one octyl group per

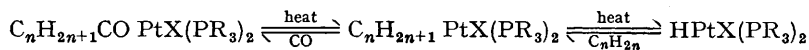


product, an oil, was established as follows. In the infrared spectrum, no trace of unsaturation was detectable in the region $1500\text{--}1600\text{ cm.}^{-1}$ but intense absorption occurred at 2060 cm.^{-1} (ν_{CO}) and

acetylacetonate group and also the primary nature of the octyl group. The original chloro-compound was thus chloro(octyl)carbonylplatinum(II).

When the chloro-compound was added to a

solution of triphenylphosphine in petrol a solid precipitated (m.p. 156°) which showed no absorption at 2060 cm^{-1} but had a moderate absorption peak at 1639 cm^{-1} which is characteristic of a platinum-acyl group.¹ The compound was thus chloro(nonanoyl)bis(triphenylphosphine)platinum(II). Thermal decomposition of this compound at 162° *in vacuo* gave a product which, when recrystallised, afforded white crystals m.p. 215–220° (dec.). This substance showed absorptions at 2231 cm^{-1} ($\nu_{\text{Pt-H}}$) and 832 cm^{-1} ($\delta_{\text{Pt-H}}$) and established the compound to be hydrochlorobis(triphenylphosphine)platinum(II).² Oct-1-ene was also formed in the decomposition reaction and this is taken as evidence for the presence of the original eight-carbon fragment as a saturated alkyl group since the following interconversions are already known^{1,2}:



(X = halogen, R = alkyl)

(Received, February 21st, 1966; Com. 108.)

¹ G. Booth and J. Chatt, *Proc. Chem. Soc.*, 1961, 67.

² J. Chatt and B. L. Shaw, *J. Chem. Soc.*, 1962, 5075.

³ J. Chatt and B. L. Shaw, *J. Chem. Soc.*, 1959, 4020.

⁴ C. R. Kistner, J. H. Hutchinson, J. R. Doyle, and J. C. Storlie, *Inorg. Chem.*, 1963, 2, 1255.