

Novel indenyl half-sandwich osmium(II) complexes. X-ray structure of $[\text{Os}(\eta^5\text{-C}_9\text{H}_7)\text{C}(\text{H})\text{Bu}^t](\text{PPh}_3)_2][\text{PF}_6] \cdot \text{OEt}_2$.

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Dedicated to Profesor Rafael Usón with great admiration for his outstanding contribution to modern Inorganic Chemistry

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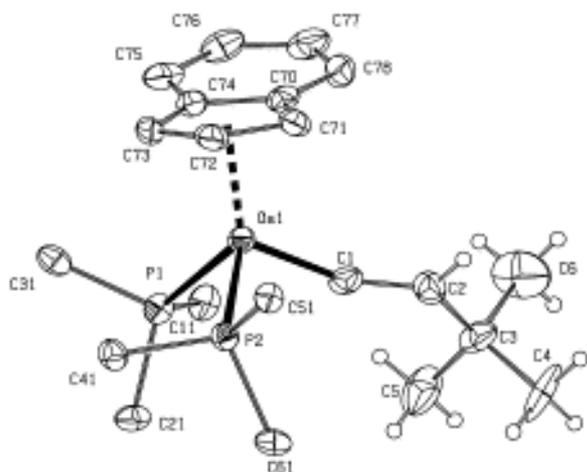
Abstract

Reaction of LiC_9H_7 with $[\text{OsBr}_2(\text{PPh}_3)_3]$ gives the complex $[\text{Os}(\eta^5\text{-C}_9\text{H}_7)\text{Br}(\text{PPh}_3)_2]$ (**1**). The analogous complex $[\text{Os}(\eta^5\text{-C}_9\text{H}_7)\text{I}(\text{PPh}_3)_2]$ (**2**) is obtained from the metathesis reaction of $[\text{Os}(\eta^5\text{-C}_9\text{H}_7)\text{Cl}(\text{PPh}_3)_2]$ with NaI. The treatment of $[\text{Os}(\eta^5\text{-C}_9\text{H}_7)\text{X}(\text{PPh}_3)_2]$ with NaOMe leads to the hydride derivative $[\text{Os}(\eta^5\text{-C}_9\text{H}_7)\text{H}(\text{PPh}_3)_2]$ (**3**) which can be protonated with HBF_4 to yield the cationic complex $[\text{Os}(\eta^5\text{-C}_9\text{H}_7)\text{H}_2(\text{PPh}_3)_2][\text{BF}_4]$ (**4**). Abstraction of the halide ligand in complexes $[\text{Os}(\eta^5\text{-C}_9\text{H}_7)\text{X}(\text{PPh}_3)_2]$ with NaPF_6 or AgBF_4 followed by the treatment with NCMe or terminal alkynes yield complexes $[\text{Os}(\eta^5\text{-C}_9\text{H}_7)(\text{NCMe})(\text{PPh}_3)_2][\text{BF}_4]$ (**6**) and $[\text{Os}(\eta^5\text{-C}_9\text{H}_7)\text{COCH}_2(\text{CH}_2)_3\text{CH}_3](\eta^5\text{-C}_9\text{H}_7)$ (**7**) respectively. X-ray crystal structure of the vinylidene derivative $[\text{Os}(\eta^5\text{-C}_9\text{H}_7)\text{C}(\text{H})\text{CH}=\text{CH}_2](\text{PPh}_3)_2][\text{PF}_6] \cdot \text{OEt}_2$.

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$\text{C}^{\sim}\dots\text{C}(\text{H})^{\text{tBu}}\{\hat{\text{I}}\cdot^5\text{-C}_9\text{H}_7\}(\text{PPh}_3)_2[\text{PF}_6]$ is reported along with variable temperature NMR studies.

Novel indenyl osmium(II) complexes $[\text{Os}(\hat{\text{I}}\cdot^5\text{-C}_9\text{H}_7)\text{X}(\text{PPh}_3)_2]$ ($\text{X}=\text{Br}, \text{I}$) are reported. They prove to be good precursors in the synthesis of neutral $[\text{Os}(\hat{\text{I}}\cdot^5\text{-C}_9\text{H}_7)\text{H}(\text{PPh}_3)_2]$, $[\text{Os}(\hat{\text{I}}\cdot^5\text{-C}_9\text{H}_7)\text{Br}(\text{PPh}_3)\text{L}]$ ($\text{L}=\text{PMe}_3, \text{PMe}_2\text{Ph}$) and cationic $[\text{Os}(\hat{\text{I}}\cdot^5\text{-C}_9\text{H}_7)\text{L}(\text{PPh}_3)_2][\text{X}]$ ($\text{L}=\text{H}_2, \text{CH}_3\text{CN}, \text{X}=\text{BF}_4$; $\text{L}=\text{COCH}_2(\text{CH}_2)_3\text{CH}_2, \text{X}=\text{PF}_6$) derivatives. The X-ray crystal structure of the vinylidene derivative $[\text{Os}\{\hat{\text{I}}\cdot^5\text{-C}_9\text{H}_7\}(\text{PPh}_3)_2][\text{PF}_6]$ is also reported.



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Keywords

Crystal structures; Osmium complexes; Indenyl complexes; Half-sandwich complexes

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