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Preliminary communication

Ligand displacement reactions of 1,5-cyclooctadienetricarbonylruthenium

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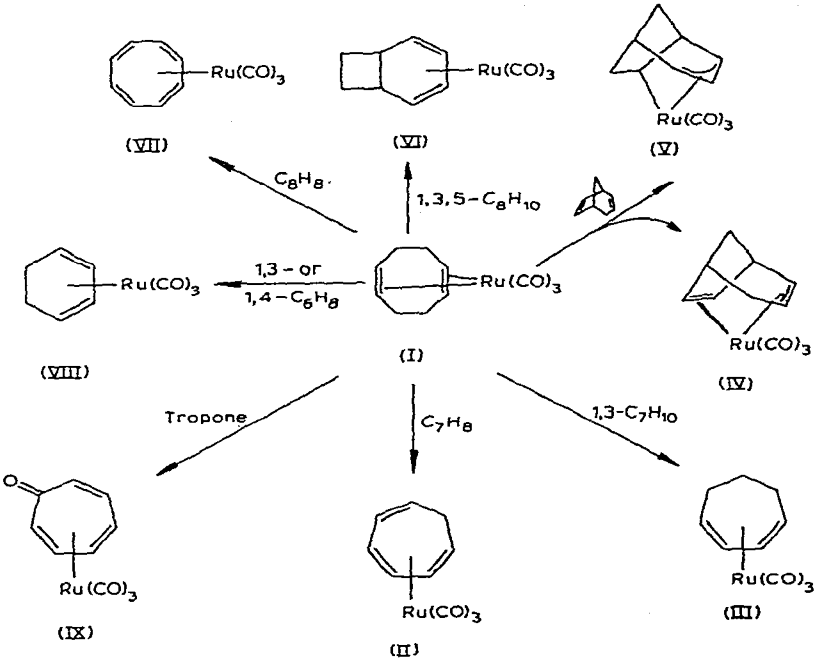
The use of organometallic compounds as potential synthetic intermediates in organic chemistry is very dependent upon the availability of a convenient and efficient source of the appropriate organometallic derivative. We have previously reported[1] the use of the complex benzylideneacetone irontricarbonyl as a convenient source of the irontricarbonyl unit and now wish to report the use of 1,5-cyclooctadienetricarbonyl-



Scheme 1

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ruthenium[2] as a precursor material for the preparation of a range of diene--tricarbonylruthenium complexes.

The (diene)$Ru(CO)_3$ complexes which have been prepared by displacement of 1,5-cyclooctadiene from $(1,5\text{-}C_8H_{12})Ru(CO)_3$ (I) are presented in Scheme 1. In general they are produced by reaction of (I) with the appropriate diene in benzene under reflux. Although alternative routes exist for the preparation of the complexes (VII)[3] and (VIII)[4] the ligand displacement method described here offers two distinct advantages. First the absence of side reactions leads to very high yields and facilitates the purification of the required product, and, secondly, the short time generally required for the reaction to go to completion (~30 mins) avoids the polymerisation of (diene)$Ru(CO)_3$ complexes commonly observed with other preparative routes. With 1,3-cyclooctadiene or mesitylene displacement of 1,5-cyclooctadiene does not take place and with bicyclo[2.2.1]-2,5-heptadiene (nor-C_7H_8) or tertiary phosphines (L) the expected products (nor-C_7H_8)$Ru(CO)_3$ and $L_2Ru(CO)_3$ are not produced. In the reaction with benzylideneacetone a metal hydrido complex $H(C_{10}H_9O)Ru_2(CO)_6$ is formed. These reactions will be described in detail in the full report of this work.

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