Synthesis, Molecular Structure, and $^1$H NMR Analysis of Bis(tetraphenylcyclopentadienyl)ruthenium(II)


Abstract

Reaction of [Ru(p-cymene)Cl$_2$]$_2$ with K($\eta^5$-C$_5$HPh$_4$) in refluxing diglyme yields ($\eta^5$-C$_5$HPh$_4$)$_2$Ru in ca. 50% yield. The complex was not susceptible to oxidation or reduction. An X-ray crystal structure of (C$_5$HPh$_4$)$_2$Ru was obtained. The metal-centroid distance is 1.832(2) Å and all other bond lengths and angles are similar to other octaphenylmetallocenes. $^1$H NMR analysis employing 2D $J$-resolved, COSY and low temperature techniques allowed assignment of all protons in the molecule. The motional processes of the phenyl groups are discussed.

*Marshall University undergraduate student