

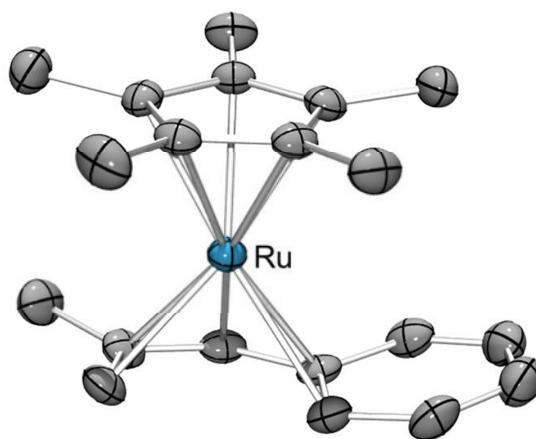
Synthesis and Organometallic Chemistry of a Novel Open Indenyl Ligand

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The cyclopentadienyl (Cp) ligand and its derivatives are the most important class of ligands in organometallic chemistry. These ligands are easily accessible, modifiable and due to their aromatic nature very stable.

By breaking one of the C-C bonds a non-cyclic, non-aromatic ligand, the pentadienyl (open-Cp) ligand can also be envisioned. This class of ligands has been widely explored by several working groups; most prominent among them is the group of Ernst *et al.*^[1] The open-Cp ligands have similarities to both allyl and cyclopentadienyl ligands. This can be observed by the η^1 , η^3 and η^5 coordination modes being readily available. This flexible coordination behavior is also often observed in hetero-pentadienyl ligands.^[2]



Indenyl ligands are a well known sub class of cyclopentadienyl ligands, breaking a C-C bond in such a system then leads to open-indenyl ligands. Recently, our group has developed a novel open-indenyl ligand which switches readily from η^5 to η^3 coordination in the complex $\text{Cp}^*\text{Ru}(\eta^5\text{-C}_{10}\text{H}_{11})$. For example coordination of either a phosphine or a carbonyl ligand resulted in a η^3 bonding mode. Similar behavior has been observed in a related half-open hetero-pentadienyl ruthenium complex, however here reaction under prolonged reflux (6 to 10 h) was needed to obtain the adducts.^[3] The ease with which the open-indenyl ligand, presented here, can switch between coordination modes can result in interesting properties for catalytic reactivity in which the ligand adopts a different bonding mode to accommodate an incoming substrate molecule.

[1] a) R. D. Ernst, *Chem. Rev.* **1988**, *88*, 1255. b) R. D. Ernst, *Comments Inorg. Chem.* **1999**, *21*, 285.

[2] J. R. Bleeke, *Organometallics* **2005**, *24*, 5190. b) M. Angeles Paz-Sandoval, I. Idalia Rangel-Salas, *Coord. Chem. Rev.* **2006**, *250*, 1071.

[3] M. E. Navarro Clemente, P. Juarez Saaverdra, M. Cervantes Vasquez, M. A. Paz-Sandoval *Organometallics* **2002**, *21*, 592.