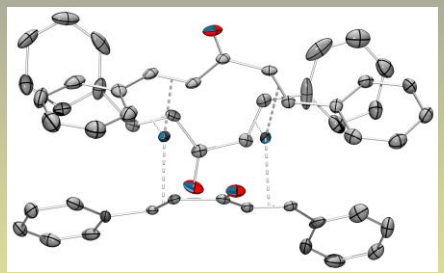
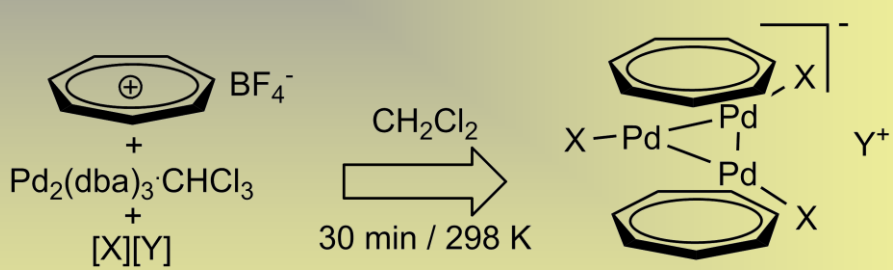
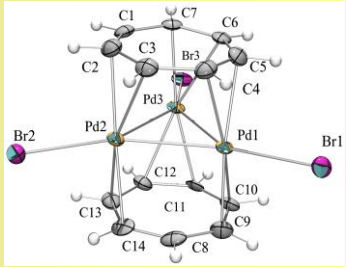
Multi-Dimensional Palladium and Platinum Systems

Palladium is a critical metal for catalysis in organic synthesis as well as in the petroleum industry. Our group is interested in designing new organometallic systems (e.g. $[Pt_3Tr_2X_3]^-$) and enhancing existing systems such as palladium(0) dibenzylideneacetone, $[Pd_2(dba)_3]$, in order to create multi-dimensional, catalytic systems. We have synthesized a series of platinum and palladium dba analogs and have observed systematic effects in both the ^1H NMR and UV-Visible spectra, as well by single-crystal X-ray diffraction analysis.







We have also demonstrated the ability to bind a number of nitrogen-based ligand systems (L) including acetonitrile and benzonitrile to the palladium sandwich complex $[Pd_3Tr_2(L)_3]^{2+}$. Our successful incorporation of the bidentate, linker ligand 4-cyanopyridine, will now allow us the design multi-dimensional arrays stabilized by additional interactions between the non-coordinated lone-pair and other metal ions.

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