NOVEL N-HETEROBICYCLIC DICARBENES AND C_2-SYMMETRIC BICYCLIC GUANIDINATES AS DINUCLEATING LIGANDS IN TRANSITION METAL CHEMISTRY

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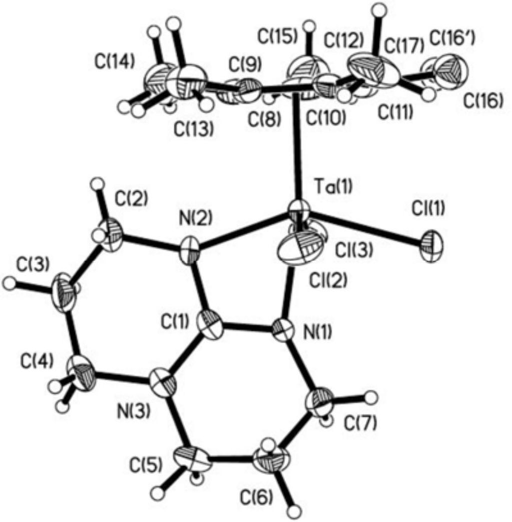
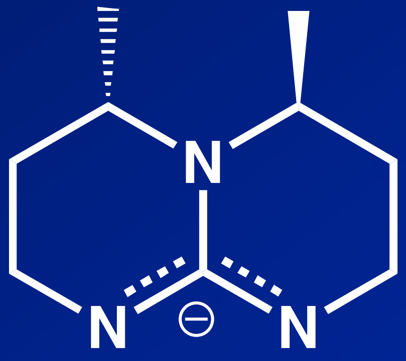
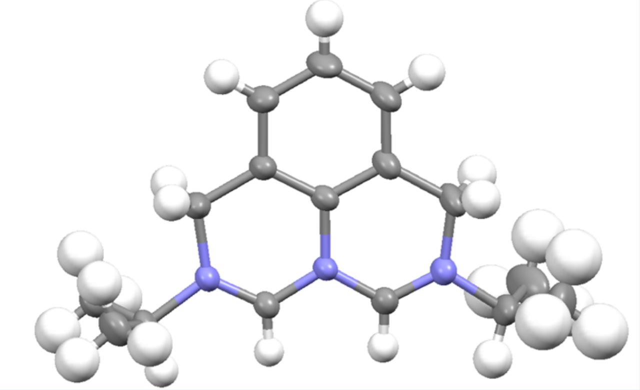
Dinucleating ligands have long been used to support complexes with transition metal-metal multiple bonds. New architectures that are resistant to metallation and cleavage are needed for early transition metals. The bicyclic guanidinate hpp^- has been used to prepare novel W_2, V_2, and Nb_2 complexes. We have found that hpp^- can be coordinated to tantalum to yield logical precursors to ditantalum complexes and that C_2-symmetric Me_2hppH can be prepared stereoselectively and yields more soluble metal complexes. We have extended the dinucleating ligand architecture to an N-heterobicyclic dicarbene that has been synthesized and spectroscopically characterized as the Li^+ adduct.



$Cp^*Ta(hpp)Cl_3$



C_2-symmetric Me_2hpp



Bis(formamidinium) dication (BF_4 anions omitted; N, blue) precursor to dicarbene)