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PREPARATION OF A LINEAR, CONJUGATED AMINE AND ITS REACTIVITY WITH THE HEXAMOLYBDATE ION

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Polyoxometalates are anionic transition metal oxide clusters. The metal ions in these clusters are typically $d^0$ species: V(V), Nb(V), Ta(V), Mo(VI), W(VI). In some cases, it is possible to form bonds between common organic functional groups and these inorganic clusters. Organic derivatives of polyoxometalates have potential uses in medicine; in catalysis; and in the preparation of macromolecular and supramolecular species, such as polymers and rotaxanes. A rotaxane is a supramolecular entity in which a linear molecule has been threaded through a macrocyclic ring. The ring is held in place through the addition of bulky stoppering groups to the ends of the linear molecule. We propose to build a rotaxane using a conjugated, difunctional amine as the linear molecule, an appropriate macrocycle as the ring, and hexamolybdate ions (Mo$_6$O$_{19}^{2-}$, a common polyoxometalate) as the stoppers. To this end, we have prepared the amine shown below (Figure 1) according to the procedure of Hogarth et al. and have explored its reactivity with n-tetrabutylammonium hexamolybdate (Figure 2).

Figure 1. A linear, conjugated amine.
Figure 2. The n-tetrabutylammonium salt of the hexamolybdate ion