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Preparation of a Linear, Conjugated Amine and its Reactivity with the Hexamolybdate Ion

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

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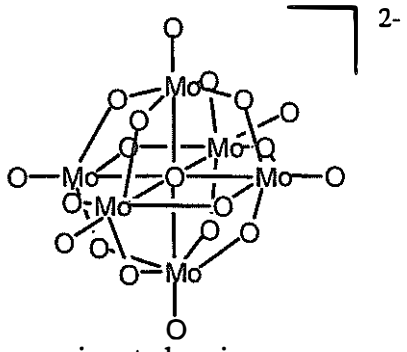
Polyoxometalates are anionic transition metal oxide clusters. The metal ions in these clusters are typically d^0 species: V(V), Nb(V), Ta(V), Mo(VI), W(VI). In some cases, it is possible to form bonds between common organic functional groups and these inorganic clusters. Organic derivatives of polyoxometalates 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 ($Mo_6O_{19}^{2-}$, 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.[1] and have explored its reactivity with n-tetrabutylammonium hexamolybdate (Figure 2).



2 $[N(CH_2CH_2CH_2CH_3)_4]^+$

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

[1]Hogarth et. al. "Linking metal centers with diimido ligands: synthesis, electronic and molecular structure and electrochemistry of organometallic ditungsten complexes $[\{WCl_2(Ph_2PMe)_2(CO)\}_2(N\text{-}X\text{-}N)]$ (X = π-conjugated organic) *J. Chem. Soc., Dalton Trans.*, 1999. pp 2705-2723.