**Preparation and Characterization of Cobalt(III) Surfactants**

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**Introduction**

In 1993, Sargeson and Behm reported soap-like molecules that destroy the surface membranes of parasitic worms. One of these molecules has a water soluble head which carries a tripositive electrical charge due to a transition metal, cobalt(III). The molecule also has a long alkyl tail that is fat soluble. Molecules similar in structure to this include soaps, detergents, and the walls of cells. When a dilute solution of this molecule is placed in solution with tapeworms, their membrane outer structures start to disintegrate within 8 minutes. It is thought that molecules with more highly charged heads bind more tightly to cell membranes and, thus, have a more disruptive effect.

We want to extend this work to a series of one and two tailed complexes of cobalt(III) to gain insight into  
1) the effects of changing tail length  
2) the effects of changing from one to two tails  
3) the effect of head group charge

on the interaction of these tripositive complexes with membranes. We report here on the preparation and characterization of a series of single tailed complexes with a 2+ charge.

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**Conclusions & Future Work**

1. We have been able to prepare a series of cobalt(III) complexes coordinated by single alkyl tails of varying lengths. Carbon and hydrogen NMR confirms the identity of the complexes.

2. The amine/nitrile two-tailed complex has been prepared, but needs to be characterized.

3. The complexes we have prepared can be used in studies with membranes to see how the various tail lengths affect membrane interactions.