Prelab Assignment: Qualitative Analysis of Group III Cations

1. Given the very low value of $K_{sp}$ for Cr(OH)$_3$, a precipitate of Cr(OH)$_3$ would be expected if only 6 M NaOH were added to the mixture of Group III cations in the first step of the procedure. Explain how and why the chromium remains in solution.

2. A solution may contain one or more of the Group III cations. When this solution is combined with NaOH (aq), NaOCl (aq) and NH$_3$ (aq) only a colorless solution is obtained with no precipitate evident. Indicate whether each of the following cations is present, absent or undetermined.

   Cr$^{3+}$
   Al$^{3+}$
   Fe$^{3+}$
   Ni$^{2+}$

   Explain.