

Metal Complex Formation in Melts of Acetamide-Ammonium Nitrate-Water Mixtures, Part I. Cobalt(II) Chloride Complexes

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The complex formation between cobalt(II) and chloride ions in molten $\text{NH}_4\text{NO}_3 \cdot 2.61\text{H}_2\text{O}$, $\text{NH}_4\text{NO}_3 \cdot \text{CH}_3\text{CONH}_2 \cdot 1.61\text{H}_2\text{O}$ and $\text{NH}_4\text{NO}_3 \cdot 2.61\text{CH}_3\text{CONH}_2$ has been investigated. Absorption spectra of cobalt(II) chloride containing variable amounts of ammonium chloride were recorded at 45 to 60 °C. In the absence of chloride, the solutions show spectra typical for octahedral co-ordination of cobalt(II). Addition of chloride caused a shift of the absorption maximum toward lower energies and an increase of the molar absorption coefficient with increasing chloride concentration. The position of the absorption maximum and the intensity of the absorption indicate tetrahedral or severely distorted octahedral co-ordination. The stability constants for $[\text{Co}(\text{NO}_3)_4]^{2-}$, $[\text{Co}(\text{NO}_3)_2\text{Cl}_2]^{2-}$ and $[\text{CoCl}_4]^{2-}$ complex formation in $\text{NH}_4\text{NO}_3 \cdot 2.61\text{CH}_3\text{CONH}_2$ are reported.

Key words: Cobalt(II) Chloride Complexes; Acetamide; Ammonium Nitrate; Stability Constants.