

Electronic Spectra and Stability of Cobalt Halide Complexes in Molten Calcium Nitrate Tetrahydrate

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The complex formation between cobalt(II) and chloride and bromide ions in molten calcium nitrate tetrahydrate at different temperatures has been studied by a spectrophotometric technique. Addition of halide ions to cobalt(II) nitrate solution in calcium nitrate tetrahydrate caused a pronounced shift of the absorption maximum toward lower energies and a large increase of absorption intensity, indicating a change from octahedral to a tetrahedral co-ordination. The change of co-ordination depends on temperature and halide concentration. Stability constants for the $[\text{Co}(\text{NO}_3)_4]^{2-}$, $[\text{Co}(\text{NO}_3)_2\text{X}_2]^{2-}$ and $[\text{CoX}_4]^{2-}$ complexes at 40 and 70 °C and the corresponding species spectra are reported.

Key words: Cobalt(II) Halide Complexes; Calcium Nitrate Tetrahydrate; Stability Constants.