The Circular Dichroism of Tris(L-prolinato)cobalt(III)

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(Received August 23, 1965)

It is shown by the construction of molecular models that the tris(L-prolinato)cobalt(III) molecule can not exist in any one of the mer-Δ, mer-Λ and fac-Δ configurations but only in the fac-Λ configuration, as a result of the steric hindrance among the three coordinated L-prolinate ions. The complex was prepared as purplish-pink crystals by the reaction of diaquotetramminecobalt(III) perchlorate with L-proline in the presence of activated charcoal. Found: C, 44.17; H, 6.02; N, 10.37. Calcd. for $Co(C_5H_8NO_2)_3$: C, 44.88; H, 6.04; N, 10.47%. The absorption spectrum confirms that it is the facial form.[1]

The circular dichroism (CD) and the rotatory dispersion (ORD) curves,* shownin Fig. 1, confirm the absolute configuration (Λ) of the complex.[2] A similar CD behavior was observed in tris(L-hydroxyprolinato)cobalt(III).

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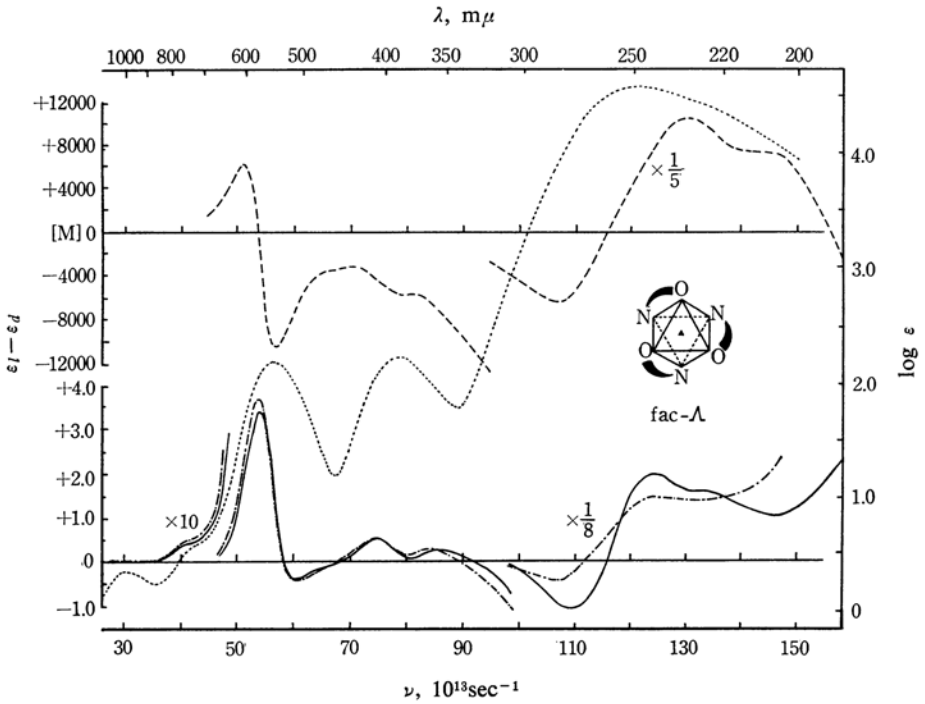

Fig. 1. CD curve (——), ORD curve (----) and absorption curve (····) of [Co(L-prol)$_3$], and CD curve (-·-·) of [Co(L-hydprol)$_3$] in 70% perchloric acid.

1) N. Matsuoka, Y. Shimura and R. Tsuchida, *J. Chem. Soc. Japan, Pure Chem. Sec.* (*Nippon Kagaku Zasshi*), **82**, 1637 (1961).

2) A. J. McCaffery and S. F. Mason, *Mol. Phys.*, **6**, 359 (1963).

* These were measured by the spectropolarimeter model ORD/UV-5 of the Japan Spectroscopic Co.