SHORT COMMUNICATIONS

X-Ray Diffraction Studies on Some Co(III) Complexes

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In connection with studies conducted at this Institute on the polarographic behavior of some Co(III) complexes,[1] structural studies on these compounds were undertaken. In this paper the results obtained for *cis*- and *trans*-$[Co\,en_2Cl_2]ClO_4$ and *cis*- and *trans*-$[Co\,en_2(C_6H_{11}COO)_2]ClO_4$ are reported. All the salts were characterised by the X-ray powder patterns taken in a Debye-Scherrer camera of diameter 114,8 mm with monochromatized Cu$K\alpha_1$ and Fe$K\alpha_1$ radiations. The salts were prepared as described by Linhard and Stirn[2] and by Carunchio, Illuminati and Maspero.[3]

Ito's[4] and Hesse-Lipson's[5,6] methods were successful in indexing powder patterns. The use of an IBM computer was helpful in applying the above said methods. X-ray powder studies so far performed lead to the following conclusions:

a) *cis*-$[Co\,en_2Cl_2]ClO_4$: the unit cell is monoclinic with dimensions $a=(7.032\pm0.001)$Å $b=(8.772\pm0.002)$Å $c=(8.000\pm0.002)$Å and $\beta=(107°2'\pm1')$. The measured density is 1.25 g/cm^3; the cell content is 1 formula unit, giving a calculated density of 1.22 g/cm^3.

b) *trans*-$[Co\,en_2Cl_2]ClO_4$: the unit cell is monoclinic with dimensions $a=(6.253\pm0.001)$Å $b=(8.065\pm0.002)$Å $c=(7.587\pm0.001)$Å and $\beta=(100°23'\pm1')$. The measured density is 1.54 g/cm^3; the cell content is 1 formula unit, giving a calculated density of 1.55 g/cm^3.

c) *cis*-$[Co\,en_2(C_6H_{11}COO)_2]ClO_4$: the unit cell is orthorhombic with dimensions $a=(8.696\pm0.002)$ Å $b=(15.625\pm0.006)$Å and $c=(10.870\pm0.003)$Å. The measured density is 1.18 g/cm^3. For 2 formula units in the unit cell the calculated density is 1.20 g/cm^3.

d) *trans*-$[Co\,en_2(C_6H_{11}COO)_2]ClO_4$: the unit cell is orthorhombic with dimensions $a=(7.407\pm0.001)$Å $b=(16.667\pm0.007)$Å and $c=(10.753\pm0.003)$Å. The measured density is 1.35 g/cm^3. For 2 formula units in the unit cell the calculated density is 1.33 g/cm^3.

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