

Synthesis and Molecular Structure of $[\text{Cd}(\text{phen})_2(\text{NO}_3)_2]$

Taeb, A. - Zeneyedpour, L. - Manteghi, F. - Tadjarodi, A.

Iran University of Science & Technology, Tehran, Iran

Key Words : *Cadmium Complex, Molecular Structure, 1, 10 - Phenanthroline, Methylurea, Urea*

Abstract: In this research, Complex $[\text{Cd}(\text{phen})_2(\text{NO}_3)_2]$ was synthesized and the structure was determined by single-crystal X-ray diffraction method. This complex was synthesized by using 1, 10 - Phenanthroline and each of complexes $[\text{Cd}(\text{Meurea})_6](\text{NO}_3)_2$ and $[\text{Cd}(\text{urea})_4](\text{NO}_3)_2$ at 50-60°C. This complex crystallizes in triclinic crystal system, space group $P(-1)(2)$ with two molecules in the unit cell. Lattice parameters of this compound are:

$$\begin{aligned} a &= 9.6008(5)\text{\AA} & b &= 9.6044(3)\text{\AA} & c &= 13.4376(11)\text{\AA} \\ \alpha &= 99.5624(4)^\circ & \beta &= 99.5564(6)^\circ & \gamma &= 105.0862(3)^\circ \\ V &= 1152.65(13)\text{\AA}^3 & D_{\text{calc}} &= 1.7221 \text{ mg/m}^3 \end{aligned}$$

After structural determination, R and R_w constants decreased to 0.0772 and 0.0935, respectively. The Cd atom in this complex was eight-coordinated. In addition, Ir and XRD studies also carried out.