

# Synthesis, Crystal Structure and Thermal Decomposition Mechanism of a Dysprosium(III) *p*-Fluorobenzoate 1,10-Phenanthroline Complex

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A dinuclear dysprosium(III) *p*-fluorobenzoate 1,10-phenanthroline complex, [Dy(*p*-FBA)<sub>3</sub>phen]<sub>2</sub> was synthesized and characterized by elemental analysis, UV and IR spectroscopy, single crystal X-ray diffraction, molar conductance, and TG-DTG techniques. It crystallizes in the triclinic space group  $P\bar{1}$  with  $a = 9.895(5)$ ,  $b = 11.754(6)$ ,  $c = 14.756(10)$  Å;  $\alpha = 106.660(9)^\circ$ ,  $\beta = 107.956(9)^\circ$ ,  $\gamma = 101.472(7)^\circ$ ;  $Z = 1$ . The Dy(III) ions are eight coordinate including one terminal bidentate chelating carboxylate group, four bridging carboxylate groups and one 1,10-phenanthroline molecule. The thermal decomposition of [Dy(*p*-FBA)<sub>3</sub>phen]<sub>2</sub> has been followed by thermal analysis. The lifetime equation at weight-loss of 10 % was deduced as  $\ln \tau = -27.0798 + 19010.2434/T$  by isothermal thermogravimetric analysis.

**Key words:** *p*-Fluorobenzoic Acid, Crystal Structure, 1,10-Phenanthroline, Dysprosium Complex, Thermal Analysis