

## **Synthesis, Identification of Mn(II), Nb(II) and Pt(IV) Complexes with the Ligand Mixture (Ethylenediamine+ Glycine) and Study their Physical Properties and their Thermodynamic Stabilities**

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**Abstract :** The complexes of Mn(II), Nb(II) and Pt(IV) were synthesized by using the Ligand Mixture (Ethylenediamine + Glycine with the ratio 2 : 1) as a ligand. They were characterized by many techniques such as the element analysis, FTIR spectroscopy and UV.VIS. spectroscopy. Their physical properties such as electric conductivity and magnetic features were determined. Their stepwise and overall stability constants and their thermodynamic functions ( $\Delta G^0$ ,  $\Delta S^0$  and  $\Delta H^0$ ) were determined. It was found that Mn(II) and Nb(II) complexes have paramagnetic features, whereas Pt(IV) has diamagnetic features. All the complexes have good conductivity. The formula of the complexes under this paper were detected by using the mole ratio method which lead to the formation of (1 : 3) metal : ligand formula for all the complexes under this paper. In all the complexes the coordination was through N atoms of the amino groups and O atom of the hydroxyl group. The suggested geometrical shapes of the complexes were the octahedral shape due to the  $d^2sp^3$  hybridization. Their stepwise stability constants were determined, it was found that for all the complexes they were increased toward the addition of ligand that because of the chelate effect. Their overall stability constants were determined, it was found that for all the complexes were high that because of the chelate effect. Their thermodynamic functions (  $\Delta G^0$ ,  $\Delta S^0$  and  $\Delta H^0$  ) were had negative value, that refer to good stability for the complexes and these results were satisfied with the spontaneous reaction and high stability complexes.

**Keywords :** ethylenediamine, glycine stepwise stability constant, overall stability constant, Nb(II) complex.

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