

## Design, Spectroscopic, Structural Characterization, and Biological Studies for New Complexes via Charge Transfer Interaction of Ciprofloxacin Drug With $\pi$ Acceptors

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**Abstract :** Ciprofloxacin (CIP) is a common antibiotic drug used as a study electron donor that interacts with dynamic  $\pi$  - acceptors such as 2,3-dinitrosalsylic acid (HDNS) and Tetracyanoethylene (TCNE) for synthesizing a new model of charge transfer (CT) complexes. The synthesized complexes were identified using diverse analytical methods such as UV-vis spectra, photometric titration measurements, FT-IR, HNMR Spectroscopy, and thermogravimetric analysis techniques (TGA/DTA). The stoichiometries for all the formed complexes were found to be a 1:1 M ratio between the reactants. The characteristic spectroscopic properties such as transition dipole moment ( $\mu$ ), oscillator strength (f), formation constant (KCT), ionization potential (ID), standard free energy ( $\Delta G$ ), and energy of interaction (ECT) for the CT-complexes were collected. The developed CT complexes were tested for their toxicity on main organs, antimicrobial activity, antioxidant activity, and biofilm formation.

**Keywords :** biological, biofilm, toxicity, thermal analysis, charge transfer, spectroscopy

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