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## Synthesis, spectroscopic, biological activity and thermal characterization of ceftazidime with transition metals

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### Abstract

Synthesis, physicochemical characterization and thermal analysis of ceftazidime complexes with transition metals (Cr(III), Mn(II), Fe(III), Co(II), Ni(II), Cu(II), Zn(II), Cd(II) and Hg(II)) were discussed. It's obtained that ceftazidime act as bidentate ligand. From magnetic measurement and spectral data, octahedral structures were proposed for all complexes except for Cobalt, Nickel and mercury had tetrahedral structural. Hyper chemistry program confirmed binding sites of ceftazidime. Ceftazidime complexes show higher activity than ceftazidime for some strains. From TG and DTA curves the thermal decomposition mechanisms of ceftazidime and their metal complexes were suggested. The thermal decomposition of the complexes ended with the formation of metal oxides as a final product except in case of Hg complex.

### Keywords

Cephalosporins -Complexes– Ceftazidime–Thermal analysis-Biological activity

### Introduction

Ceftazidime is a third generation of cephalosporin. Ceftazidime is characterized as one of the most important medication which is needed in basic health system for treatment of several infections such as joint infections and vibrio infection. Also ceftazidime is characterized by beta lactam ring in its structure and stability to  $\beta$ -lactamases which bacteria produce it [1].

Previous work in Ceftazidime metal complexes fell to synthesis ceftazidime complexes with (Cr, Mn, Zn and Hg) and didn't study the thermal analysis of ceftazidime metal complexes [2] In the present work conformational changes and biding of ceftazidime towards transition metals were identified by IR, electronic spectra, ESR and magnetic susceptibility. Also thermal analysis of ceftazidime and their metal complexes were discussed from thermo-gravimetric and differential analysis curves. Also mechanism of decomposition is discussed. Kinetic parameters were evaluated.

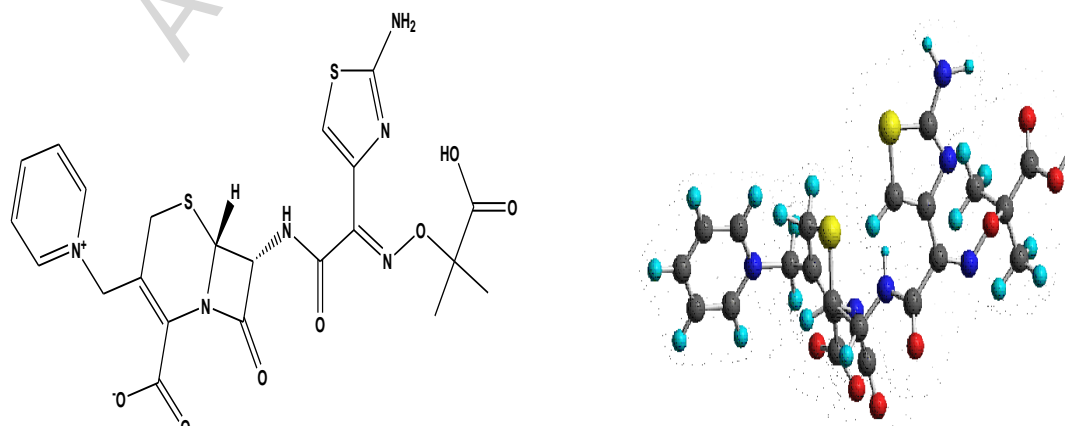


Figure (1): Structure of Ceftazidime, HL

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