

# A Spectroscopic and Kinetic Investigation on the Substitution of Fe(III) for Ni(II) in a Siderophore Model

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A kinetic and spectroscopic study was performed on the substitution of Fe(III) by Ni(II) in the water soluble anion  $[\text{Fe}(\text{L}^{1-})_2\text{L}^{2-}]^-$ , a siderophore model ( $\text{L}^-$  = dopa-semiquinone and  $\text{L}^{2-}$  = dopa-catecholate). The reaction was followed in the UV/vis range through the appearing of an intense band at 592 nm due to the anion complex  $[\text{Ni}(\text{L}^{1-})_3]^-$  formed which also presents a resonance Raman effect. The overall reaction obeyed a zero-order rate law at 25, 35, 45, and 50 °C, and the rate constants and thermodynamic parameters have been obtained. A chemometric study based on the Imbrie Q-type factor analysis revealed that the reaction occurred with only one kind of intermediate whose UV/vis spectrum has been calculated.

**Key words:** Siderophore, Raman Resonance, Dopamine, Catecholamine, Iron