INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Thesis Title: Effect of Pyridine and Imidazole Functionality on Chiral Resolution, Solution Spin State and Electrochemistry within Ni (II) and Fe (II) Complexes.

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SHORT ABSTRACT

Effect of Pyridine and Imidazole Functionality on Chiral Resolution, Solution Spin State and Electrochemistry within Ni (II) and Fe (II) Complexes.

This thesis work stems from our quest to find a simple way to recognize an enantiomer from a racemic mixture using coordination bond. To do that, we choose to use Ni (II)(high-spin) and Fe (II) (low-spin) complexes of chiral bidentate Schiff-base ligands. Observations on Fe (II) complexes led to finding complexes that show high- spin <--> low-spin transitions in solution. Digging deeper with more complexes along with a host of electrochemical and spectrometric tools, we ended up finding an intimate relationship between donor groups, redox potential, and spin-state. The effect of replacing pyridine with imidazole on redox and the spin-state properties discussed in the thesis is relevant to biomimetic chemistry. Imidazole group is a part of L- histidine amino acid, ubiquitous in metalloenzyme active sites. On the other hand, pyridine donor is typical in ligands related to biomimetic chemistry.