INDO SWISS JOINT RESEARCH PROGRAMME (ISJRP)

JOINT UTILISATION OF ADVANCED FACILITIES

EXCHANGE GRANT REPORT

Grant No.: JUAF06

Part 1 - General Information

<table>
<thead>
<tr>
<th>Project Title:</th>
<th>Synthesis of bio-inspired Fe(II)/Fe(III) complexes with P,N donor hemilabile ligands</th>
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<tr>
<td>Keywords:</td>
<td>Fe(II)/Fe(III) complexes, low-spin, hemilabile ligand, X-ray structure, magnetic study</td>
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<td>Start date:</td>
<td>August 31, 2009</td>
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<td>Duration:</td>
<td>2 weeks</td>
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Part 2 - Exchange Participant(s) Details

VISITING SCIENTIST

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HOSTING SCIENTIST

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3.1 Purpose of visit

The chemistry of low-spin, mononuclear Fe(II) and Fe(III) complexes with different types of mixed donor ligands bearing N as one of the donor atoms is well established because of their structural resemblance with the active site of several non-heme metalloproteins. Thus, the main purpose of my visit was to synthesis some bio-inspired Fe(II) / Fe(III) complexes with mixed donor functionalized phosphine ligands and to characterize the complexes by using sophisticated analytical instrumentation methods available at the University of Fribourg.

3.2 Short description of work carried out during the visit

(i) During my short stay at the University of Fribourg, we have synthesized a few Fe(II)/Fe(III) and Co(II) complexes with some functionalized phosphine ligands.

(ii) The identity of the complexes were established by different spectroscopic techniques such as Mass spectrometer (MALDI as well as ESI methods), NMR (¹H and ³¹P) etc. by utilizing the infrastructural facility present in the University of Fribourg.

(iii) In order to perform structural characterisation X-ray single crystals were generated for two of the complexes and structural studies will be performed.

(iv) The excellent library resources of the University of Fribourg have been used to perform thorough literature survey on the concerned subject matter.

3.3 Outcomes

The research work performed at Prof. Albrecht’s Lab at the University of Fribourg and an elaborate discussion with him on the concerned subject matter will channelize a new direction of work. At the initial stage, the newly synthesized complexes will be fully characterized by using different instrumental techniques present at Dibrugarh University, India such as FTIR, UV-VIS spectroscopy, the cyclic voltammetry, etc. and some of the facilities at Fribourg University. The variable temperature magnetic study of the complexes will be performed to determine the spin-state of the complexes. It is expected that after completing all the studies we will jointly published the work in a reputed journal.

3.4 Future collaboration with host institution

Since, due to shortage of time the characterisation of the newly synthesized complexes could not be completed thus both the project partner will initially performed further characterisation techniques presents in the respective departments. After completing all the relevant study and solving the structures by X-ray crystallography a preliminary communication will be made in some specialized journals. As a follow-up activities the substitution reactivity of the complexes towards different ligands will be evaluated. Moreover, catalytic study of some of the complexes will be screened for different organic reactions. Unfortunately, there is a little possibility to make any future collaboration with the host institute within the framework of the Indo-Swiss Joint research programme as the host scientist will be
soon changing his country of residence, but a personnel project-based collaboration with the concerned scientist might be possible in the future under a different programme.

3.5 Various comments

Although, the project was initially planned for a duration of one month period but due to some visa related problems the project was cut short for a period of two weeks. However, during my two week stays at the University of Fribourg I had learned some new research tools which could be useful for me throughout my research carrier. Moreover, a fruitful discussion with Prof. Albrecht showed me new directions of work in the bioinorganic chemistry of iron and cobalt which I could easily continue at my University at Dibrugarh.

3.6 Projected publications/articles resulting or to result from the exchange

Not yet arises.