

FINAL REPORT

Section 1

Information regarding Project/Project Personnel:

- i) Contract Number: RG/2006/FR/02
- ii) Title of the Project: **Synthesis of covalently linked transition metal macrocyclic and polypyridyl complexes suitable for the reduction of water and small hazardous molecules like CO₂.**
- iii) Principal Investigator: Dr (Mrs.) M.Y.Udugala-Ganehenege
- iv) Co-Investigators: None
- v) Institute(s) where research was being carried out: University of Peradeniya
- vi) Date of award: September 06, 2006
- vii) Date of completion of Project: March 31, 2010
- viii) Total allocation of funds (Rs): **25 86 484.00**
- ix) Total spent (Rs): **25 84 852.45**
- x) Number of Research Students employed: 05
- xi) Post graduate degree completed with dates: 01 (Tentative date of the completion is in October, 2010 and he is writing the thesis of his M.Phil. Degree at present), 01 (has registered for an M.Phil. Degree)
- xii) Number of Technical Assistants and/or laborers employed and period of service: 00
- xiii) Publications/Communications arising from the project during the reporting period: 06 (published), 01 (accepted), 02 (submitted in September, 2010)

Section 2

Executive Summary of the Project:

Scientific background

Some face-to-face arranged metal macrocyclic complexes, shown in fig.1 and 2, synthesized by the chief investigator for her Ph.D. studies have shown remarkable affinities for trapping halides.^{1,2} Redox behavior in such complexes is controlled by the nature of donor atoms, the ability of the ligands to adapt to coordination geometry changes, and the distance between metal centers. Many binuclear macrocyclic complexes have been synthesized in which these parameters are varied systematically, and the influence of these parameters on electron transfer and electronic and magnetic properties has been demonstrated.^{3, 4} The relative orientation of the metal centers in binuclear complexes also plays a role in determining novel properties associated with the magnetic and electronic coupling between the metal centers through different bridging ligands. Many research have been carried out to convert or activate the bridging/coordinated ligand by using the novel properties associated with the redox and photochemical properties of the macrocyclic transition metal complexes.