

**PROCORE - FRANCE/HONG KONG JOINT RESEARCH SCHEME  
COMPLETION REPORT**

**Project Reference Number**

9052004 F-HK04/10T

**Project Title**

Electrocatalytic Oxidation of Organic Substrates in Water Catalyzed by Ruthenium and Osmium Complexes

**Particulars**

	Hong Kong team				French team			
Name of Project Co-ordinator (with title)	English: Prof. Tai-Chu Lau Chinese: 劉大鑄				Prof. Marc Robert			
Name of Co-Investigator (if any)	English: Dr Wai-Lun Man Chinese: 文偉倫				Dr. Elodie Anxolabéhère-Mallart			
Institution or Institutional affiliation	<input checked="" type="checkbox"/>	CityU	<input type="checkbox"/>	HKU	<input type="checkbox"/>	CEA	<input type="checkbox"/>	INRA
	<input type="checkbox"/>	CUHK	<input type="checkbox"/>	HKUST	<input type="checkbox"/>	CNRS No.	<input type="checkbox"/>	INRIA
	<input type="checkbox"/>	HKBU	<input type="checkbox"/>	LU	<input type="checkbox"/>	INFREMER	<input type="checkbox"/>	INSERM No.
	<input type="checkbox"/>	HKIED	<input type="checkbox"/>	PolyU	<input checked="" type="checkbox"/>	University of	Paris Diderot	
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	Others:		
Other project team members (if any)								

**Funding Period**

	1 <sup>st</sup> year	2 <sup>nd</sup> year (if applicable)
Start Date	1 Jan., 2011	1 Jan 2012
Completion Date	31 Dec 2011	31 Dec 2012

**Objective(s) as per original application**

1. To synthesize various ruthenium and osmium catalysts.
2. To study the oxidation mechanisms of the ruthenium and osmium catalysts using an electrochemical approach.
3. To investigate electrocatalytic oxidation of various organic substrates in water catalyzed by ruthenium and osmium complexes.

[Please attach relevant document(s)]

**i) Outline of proposed research and results obtained**

We have synthesized a series of cobalt and nickel complexes as potential electrocatalysts for various oxidation reactions. The synthesis was carried out at CityU. The efficiency of these complexes as electrocatalysts was then investigated at the University of Paris. Our results indicate that these catalysts are efficient electrocatalysts for oxidation of organic substrates, as well as proton reduction to generate hydrogen, and carbon dioxide reduction.

**ii) Significance of research results**

Through this scheme we have laid the ground work of a number of important electrocatalytic reactions, including proton and carbon dioxide reduction catalyzed by cobalt and nickel complexes. Two students from the Hong Kong group have travelled to the University of Paris Diderot (supported by City University of Hong Kong) to do joint research work. We believe we will be able to develop efficient electrocatalysts for water oxidation and proton reduction.

**iii) Research output**

Two papers are being prepared for publication.

**iv) Potential for or impact on further research collaboration**

We wish to continue our collaboration through a second France/HK joint research scheme. Research work supported by this scheme could also form the basis for a joint application on ANR/RGC project in 2014.