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SUMMARY REPORT

Visiting Professor research exchange between University Cergy Pontoise
and University of the Western Cape, 2013

SPONSORS:

- University of Cergy Pontoise and LPPI
- University of the Western Cape and SensorLab
- French Embassy South Africa
- European network of artificial muscles supported by
- European Co-operation in Scientific and Technical Research (COST programme, Department of Science and Technology, South Africa)

PARTICIPANTS:

South Africa: Prof PGL Baker, Meryck Ward (MSc)
France: Prof Frederic Vidal, Prof Pierre-Henri Aubert, colleagues and postgraduate students at Laboratoire de Physicochimie des Polymères et des Interfaces (LPPI)

Prof Baker, representing SensorLab research group (Chemistry, University of the Western Cape) and the colleagues from the Laboratory of Physical Chemistry of Polymers and their interfaces (LPPI) at the University of Cergy Pontoise; have shared mutual interest in the area of conductive polymers and its suitability for actuator design, through symposia hosted by the European network of artificial muscles (ESNAM) of which both laboratories are members.

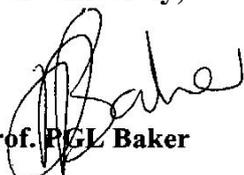
Selected polymer materials prepared by SensorLab, with potential for actuation studies, were identified for a joint research investigation based on scientific exchange modalities in order to study the chemical and physical properties of these materials extensively. The research exchange was facilitated by a student exchange visit at MSc level for a student from South Africa to spend time in France and the visiting professor appointment invitation of University Cergy Pontoise.

Meryck Ward, a full time registered MSc student at the University of the Western Cape, was successful in obtaining a mobility bursary from the French Embassy in South Africa, in order to pursue part of his MSc studies at a partner university in France. The research exchange visit took place during June-July 2013, during which period the following objectives were achieved:

- (i) The synthesis of a novel phenazine linked pyrrole monomer was successfully reproduced at LPPI;
- (ii) The monomer was chemically polymerised and characterised by thermogravimetric (TGA,DSC), electrochemical (CV), nuclear magnetic resonance (NMR) and conductivity measurements;
- (iii) In depth research evaluation involving all participating team members was facilitated by a series of meetings to discuss data and research progress. The initial results indicated that although the design of the molecule supports good electronic conductivity, the electrical conductivity was measured as very low. Alternative dopants and inclusion of gold nanoparticles into the polymer network was identified as two possible ways to pursue the realisation of an effective actuator material.
- (iv) Full time student participation and integration at LPPI (UCP) was facilitated;
- (v) A research summary report was drafted and areas for future work, future collaboration and peer reviewed publications were identified;
- (vi) A series of lectures will be delivered to MSC students (UCP) including special topics in sensors, sensing protocols and instrumentation, with case studies and results from SensorLab research output (Oct/Nov 2013)
- (vii) An exchange visit from UCP to UWC (South Africa) has been finalised under Short-Term Scientific Missions of the ESNAM programme (Dec 2013).

The participants in the research exchange between University of Cergy Pontoise (France) and the University of the Western Cape (South Africa) wish to thank all sponsors and hosts for financial and logistical support of the research activities in 2013 and look forward to continuing this partnership to produce the objectives and outputs of this vibrant and promising

Yours sincerely,



Prof. PGL Baker

Co-leader of SensorLab (UWC)

Deputy Chair: Chemistry department, (UWC)

Chair: ElectrochemSA (South African Chemical Institute)

Deputy Chair: Electroanalytical division, International Society for Electrochemistry