Damien Voiry

Ph.D.

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Education

- **PhD, Centre de Recherche Paul Pascal (CRPP-CNRS), University of Bordeaux , France — Nov. 2010**

Title: Solubilization and covalent functionalization of carbon nanotubes and other nano-forms of carbon

Supervisor: Alain Pénicaud, Research Director, CNRS, CRPP, University of Bordeaux

Co-supervisor: Oliver Roubeau, Research Associate, Instituto de Ciencias de Materiales de Aragón-CSIC, Universidad de Zaragoza, Zaragoza, Spain

- **M.Sc in chemistry and physics, University of Bordeaux, France — Sept. 2007**

National School of Chemistry and Physics (ENSCBP), specialization in Micro and Nanotechnology

- **B.Sc. in Physics and Chemistry, Lycée Descartes, University of Tours, France — Jul. 2004**

Employment Background

- **Researcher, Materials Science and Engineering, Rutgers University, NJ, USA — Jan. 2011 - Present**

Postdoctoral study: Exfoliation of 2D nanomaterials, ultra-thin films fabrication for catalytic properties (hydrogen evolution, oxygen reduction, photocatalysis), and energy storage (supercapacitors)

- **PhD student, CNRS, Centre Recherche Paul Pascal, France— Nov. 2007 - Nov. 2010**

- **Paid internship, Arkema Inc., Pau, France — May - Sept. 2007**

Vapor phase functionalization of multi-walled carbon nanotubes with silicon

- **Paid internship, Hitachi Chemical Co. Ltd., Hitachi City, Japan — Jul. - Dec. 2006**

Fuel cell fabrication and characterization of polymer membranes for Direct Methanol Fuel Cell

Fellowships

JSPS Summer Program, Nanotube Research Center, AIST Tsukuba, Tsukuba, Japan — Jun. - Aug. 2009

Teaching

Carbon nanotube laboratory experiments for undergraduate students (senior)— 2009 - 2010

Laboratory projects for undergraduate students — 2011 - Present

Metal evaporation laboratory experiments for undergraduate students — 2012 - Present

New-Jersey Governor's School of Engineering & Technology: The Hydrogen Economy — 2013

Research Activity

- **Publications**

14. Voiry, D.; Pagona, G; Del Canto, E.; Ortolani, L.; Morandi, V.; Noé, L.; Melle Franco, M.; Monthioux, M. Tagmatarchis, N. & Pénicaud, A. Individualization of single-wall carbon nanohorns: A new form of metal free carbon nanomaterial, In preparation, 2014

13. Alves, D.; Silva, R.; Voiry, D.; Ferlauto, A.; Asefa, T. & Chhowalla, M. Copper nanoparticles stabilized by reduced graphene oxide for CO_2 reduction reaction, In preparation, 2014

12. Voiry, D.; Goswami, A.; Fujita, T.; Chen, M.; Asefa, T. & Chhowalla, M. Covalent functionalization of monolayered transition metal dichalcogenides by phase engineering, Under Review, 2014

11. Yamaguchi, H.; Granstrom, J.; Nie, W.; Sojoudi, H.; Fujita, T.; Voiry, D.; Chen, M.; Gupta,G.; Mohite, A.; Graham, S. & Chhowalla, M. Reduced graphene oxide thin films as ultrabarriers for organic electronics, Accepted in Advanced Energy Materials, 2013

10. Voiry, D.; Salehi, M.; Silva, R.; Fujita, T.; Chen, M.; Asefa, T.; Shenoy, V.; Eda, G. & Chhowalla, M. Conducting MoS_2 nanosheets as catalysts for hydrogen evolution reaction, Nano Letters, 2013, 13, 6222 (Among the NL top 10 most read articles for Dec. 2013 and Jan. 14)

9. Yang, J.*; Voiry, D.*; Joon Ahn, S.; Kim, A. Y.; Chhowalla, M. & Shin, H. S. Two dimensional hybrid nanosheets of WS_2 and reduced graphene oxide as catalysts for enhanced hydrogen evolution reaction, Angewandte Chemie, 2013, 52, 13751 (*: equal contributions)

8. Voiry, D.; Yamaguchi, H.; Li, J.; Silva, R.; Alves, D.; Fujita, T.; Chen, M.; Asefa, T.; Shenoy, V.; Eda, G. & Chhowalla, M. Enhanced catalytic activity in strained chemically exfoliated WS_2 for hydrogen evolution, Nature Materials, 2013, 12, 850 (Featured in nanotechweb.org)

7. Bepete, G; Voiry, D.; Chhowalla, M.; Chiguvare, Z.; Coville, N. J. A facile CVD synthesis of BN doped graphene using boric acid and nitrogen gas, Nanoscale, 2013, 5, 6552

6. Silva, R.; Voiry, D.; Chhowalla, M. & Asefa, T. Efficient metal-free electrocatalysts for oxygen reduction: polyaniline-derived N- and O-doped mesoporous carbons, J. Am. Chem. Soc., 2013, 135, 7823

5. Eda, G.; Fujita, T.; Yamaguchi, H.; Voiry, D.; Chen, M. & Chhowalla, M. Coherent atomic and electronic heterostructures of single-layer MoS_2, ACS Nano, 2012, 6, 7311

4. Eda, G.; Yamaguchi, H.; Voiry, D.; Fujita, T.; Chen, M. & Chhowalla, M., Photoluminescence from chemically exfoliated MoS_2, Nano Letter, 2011, 11, 5111 (Among the NL top 20 most read articles for Dec. 2011 and in 2012)

3. Voiry, D.; Drummond, C. & Pénicaud, A., Portrait of carbon nanotube salts as soluble polyelectrolytes, Soft Matter, 2011, 7, 7998 (Selected as Hot Article in October 2011)

2. Voiry, D.; Roubeau, O. & Pénicaud, A., Covalent functionalization of reduced multi walled carbon nanotubes in solution , Carbon, 2011, 49, 170

1. Voiry, D.; Roubeau, O. & Pénicaud, A., Stoichiometric control of single walled carbon nanotubes functionalization, Journal of Materials Chemistry, 2010, 20, 43851

- **Patents**

Voiry, D. & Chhowalla, M. Enhanced catalytic activity in strained chemically exfoliated WS_2 for hydrogen evolution, U.S. provisional patent n°61/699,915

Voiry, D.; Pagona, G.; Pénicaud, A. & Tagmatarchis, N., Solutions of carbon nanohorns, method for making same and uses thereof, WO/2011/154894

Bordere, S.; Cochard, D.; Duthil E.; Gaillard, P. & Voiry, D. for Arkema Inc., Method and system for depositing metal or metalloid on carbon nanotubes, WO/2009/112738

- **Selected professional Papers and Presentation**

Voiry, D. Chemically exfolaited transition metal dichalcogenides and applications, invited talk at ChemOnTubes 2014, Riva Del Garda, Italy, 2014

Voiry, D. Carvalho Silva, C.; Acerce, M. & Chhowalla, M. Nitrogen sulfur boron co-doped reduced graphene oxide aerogels for oxygen reduction reaction, oral contribution presented at MRS Fall, Boston, USA, 2013

Voiry, D. & Chhowalla, M. Chemically exfoliated transition metal chalcogenides as hydrogen evolution catalysts, invited talk presented at the 246th ACS conference, Indianapolis, USA, 2013

Voiry, D. Enhanced Catalytic Activity in Strained Chemically Exfoliated WS_2 Nanosheets for Hydrogen Evolution, invited seminar given at Los Alamos Nation Laboratory, New-Mexico, USA, 2013

Voiry, D. & Chhowalla, M. Decorated graphene oxide for catalysis and bio-applications, invited talk presented at the Graphene Week, Chemnitz, Germany, 2013

Voiry, D. & Pénicaud, A., Chemical modification of graphene through functionalization, invited talk presented at the Discussion Lavoisier, Dourdan, France, 2013

Voiry, D.; Yamaguchi, H.; Li, J.; Silva, R.; Alves, D.; Fujita, T.; Chen, M.; Asefa, T.; Shenoy, V.; Eda, G. & Chhowalla, M., Catalytic properties of exfoliated layered transition metal dichalcogenides, oral contribution presented at MRS Fall, Boston, USA, 2012

Voiry, D.; Yamaguchi, H.; Salehi, M.; Fujita, T.; Chen, M.; Eda, G. & Chhowalla, M., Optoelectronic properties of exfoliated Layered Transitions Metal Dichalcogenide, poster session at MRS Fall, Boston, USA, 2012

Eda, G., Fujita, T.; Yamaguchi, H.; Voiry, D.; Chen, M. & Chhowalla, M., Heterogeneous phase structure of chemically exfoliated MoS_2 and WS_2 single layers, oral contribution presented at MRS Fall, Boston, USA, 2012

Voiry, D.; Chhowalla, M., Solution Processable Two Dimensional Materials for Energy Applications, invited talk presented at the 59th American Vacuum Society Conference 2012, Tampa (Florida), USA, 2012

Voiry, D.; Yamaguchi, H.; Li, J.; Silva, R.; Alves, D.; Fujita, T.; Chen, M.; Asefa, T.; Shenoy, V.; Eda, G. & Chhowalla, M., Optoelectronic and catalytic properties of exfoliated layered transition metal dichalcogenides, oral contribution presented at eMRS Spring, Strasbourg, France, 2012

Voiry, D.; Roubeau, O. & Pénicaud, A., Control of covalent functionalization for designing new CNT based materials, poster session at Chemontubes 2010, Arcachon, France, 2010

Voiry, D.; Roubeau, O. & Pénicaud, A., Control of covalent functionalization of SWCNT through reduction, oral contribution presented at C'nano 09, Santorini, Greece, 2009

Skills:

- **Scientific skills**

Spectroscopy: Infra-Red, Raman, UV-Visible, near Infra-Red, Photoluminescence, X-Ray Photoelectron Spectroscopy, SEM, AFM, Electrochemistry, Thermogravimetric analyses, Basic Organic synthesis, Manipulations in gloves box

- **Computer skills:**

Office, iWork, iLife, Kaleidagraph, Origin, Chemdraw, LabSpec

- **Qualification maitre de conférence:**

Sections 28 (Milieux denses et matériaux), 32 (Chimie organique, minérale, industrielle), 33 (Chimie des matériaux)

References:

Prof. Manish Chhowalla, Department of Materials Science and Engineering, Rutgers University, Tel: +1 (732) 445-5619, manish1@rci.rutgers.edu

Alain Pénicaud, Ph.D., Centre de Recherche Paul Pascal, CNRS, Tel: +33 5 56 84 30 28, penicaud@crpp-bordeaux.cnrs.fr

Patrice Gaillard, Ph.D., Chief Researcher, Arkema Inc., Tel: +33 5 59 92 69 44 , patrice.gaillard@arkema.com

Shinji Takeda, Ph.D., Chief Researcher, Hitachi Chemical Co. Ltd., Tel.: +81(0)3-5320-9117, shin-takeda@hitachi-chem.co.jp