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RESEARCH INTERESTS

Electrocatalysis for water splitting and CO_2 reduction

- Materials chemistry & characterization
- Surface modification
- Hydrogen generation and uptake
- Electrochemical sensors
- Synthesis of metallic alloy nanostructures

SUMMARY

My PhD focused on electrochemistry, nanomaterials and their applications analytical chemistry. We have developed novel and sensitive electrochemical sensors via functionalization electrode for biomarker detection. In the second part, functionalized gold nanoparticles, functionalized MWCNT and N-doped graphene and their electrochemical application were also studied. In addition, via electrochemical deposition, an ultra-high surface area electrode of 3D nanodendrite porous structure of Au, Ag or Cu were successfully synthesized. And a tunable composition of tri-metallic Pt-Au-Ag nanodendrite was also synthesized via galvanic replacement reaction of Pt and Au on dendritic Ag material.

During two years postdoctoral in the group of Dr. Vincent Artero, CEA, Grenoble, I worked on the project of "Ni-based catalyst ($[Ni(P^{Cy}_2N^{ester}_2)_2](BF_4)_2$ complex) grafted on MWCNT/GDL for H_2 generation and uptake" & "composite of Cu electrodeposited from $[Cu(cyclam)]^{2+}$ complex for selective electro-reduction of CO_2".

From September 2015, I worked in the lab of Prof. Marc Fontecave at Collge de France as a postdoctoral researcher and became a permanent member from January 2018. My research interests are focusing on developing of electrocatalysts and electrolyzers for high energy efficiency conversion of CO2 to valuable products, such as: CO, formica cid, ethylene and ethanol.

PUBLICATIONS

2021

- Coupling Electrocatalytic CO_2 Reduction with Thermocatalysis Enables the Formation of a Lactone Monomer

L Ponsard, E Nicolas, NH Tran, S Lamaison, D Wakerley, T Cantat, Fontecave M
ChemSusChem 2021, 14 (10), 2198-2204

- Benchmarking of oxygen evolution catalysts on porous nickel supports
  A Peugeot, CE Creissen, D Karapinar, HN Tran, M Schreiber, Fontecave M
  Joule 2021, 5 (5), 1281-1300
- Impact of ionomer structuration on the performance of bio-inspired noble-metal-free fuel cell anodes
  N Coutard, B Reuillard, TN Huan, F Valentino, RT Jane, S Gentil, A Vincent
  Chem Catalysis 2021, 1, 88-105

2020

- Immobilization of a Molecular Re Complex on MOF-derived Hierarchical Porous Carbon for CO2 Electroreduction in Water/Ionic Liquid Electrolyte
  D Grammatico, HN Tran, Y Li, S Pugliese, L Billon, BL Su, M Fontecave
  ChemSusChem 2020,13 (23), 6418-6425
- Functionalization of Carbon Nanotubes with Nickel Cyclam for the Electrochemical Reduction of CO_2
  S Pugliese, NT Huan, J Forte, D Grammatico, S Zanna, BL Su, Y Li, Marc F
  ChemSusChem 2020, 13 (23), 6449-6456

2019

- Carbon Nanotube supported Copper Polyphthalocyanine for Efficient and Selective Electrocatalytic CO2 Reduction to CO
  Karapinar D, Zitolo A, Ngoc Huan T, Taverna D, Galvao Tizei LH, Zanna S, Mougel V, Giaume D, Marcus P, Fontecave M.
  ChemSusChem, 2019, DOI: 10.1002/cssc.201902859
- FeNC catalysts for CO2 electroreduction to CO: effect of nanostructured carbon supports
  D. Karapinar, Ngoc-Huan Tran, D. Giaume, N. Ranjbar, F. Jaouen, V.Mougel, M. Fontecave
  Sustainable Energy Fuels, 2019, 10.1039/c9se00214f
- Electroreduction of CO2 on Single-Site Copper-Nitrogen-Doped-Carbon Material: Selective Formation of Ethanol and Reversible Restructuration of the Metal Sites
  D. Karapinar, T. N. Huan, N. Ranjbar, J. Li, D. Wakerley, N. Touati, S. Zanna, D. Taverna, L. H. Galvão Tizei, A. Zitolo, F. Jaouen, V. Mougel, M. Fontecave
  Angew. Chem. Int. Ed., 2019, DOI: 10.1002/anie.201907994
- Copper-Substituted NiTiO3 Ilmenite-Type Materials for Oxygen Evolution Reaction
  A Guiet, TN Huan, C Payen, F Porcher, V Mougel, M Fontecave, G Corbel
  ACS applied materials & interfaces 2019, 11 (34), 31038-31048
- Controlling Hydrogen Evolution during Photoreduction of CO2 to Formic Acid Using [Rh(R-bpy)(Cp*)Cl]+ Catalysts: A Structure–Activity Study
  TK Todorova, TN Huan, X Wang, H Agarwala, M Fontecave
  Inorg. Chem. 2019, 58(10) 6893-6903
- Low-cost high-efficiency system for solar-driven conversion of CO2 to hydrocarbons
  Tran Ngoc Huan, Daniel Alves Dalla Corte, Sarah Lamaison, Dilan Karapinar, Lukas Lutz, Nicolas Menguy, Martin Foldyna, Silver-Hamill Turren-Cruz, Anders Hagfeldt, Federico Bella, Marc Fontecave, and Victor Mougel
  PNAS May 14, 2019 116 (20) 9735-9740
- Zn–Cu Alloy Nanofoams as Efficient Catalysts for the Reduction of CO_2 to Syngas Mixtures with a Potential-Independent H_2/CO Ratio
  Sarah Lamaison, David Wakerley, David Montero, Gwenaëlle Rousse, Dario Taverna, Domitille Giaume, Dimitri Mercier, Juliette Blanchard, Huan Ngoc Tran, Marc Fontecave, Victor Mougel

ChemSusChem 12 (2019) 511-517

2017

- Pt Immobilization within a Tailored Porous-Organic Polymer–Graphene Composite: Opportunities in the Hydrogen Evolving Reaction
  Ahmed Soliman, Mohamed Hassan, Tran Ngoc Huan, Arwa Abugable, Worood Elmehalmey, Stavros Karakalos, Manuel Tsotsalas, Marita Heinle, Mady Elbahri, Marc Fontecave, Mohamed Alkordi
  ACS Catalysis 7 (2017), 7847-7854
- A Dendritic Nanostructured Copper Oxide Electrocatalyst for the Oxygen Evolution Reaction
  Tran Ngoc Huan, Gwenalle Rousse, Sandrine Zanna, Ivan T. Lucas, Xiangzhen Xu, Nicolas Menguy, Victor Mougel, Marc Fontecave
  Angewandte Chemie – 56 (2017), 4792-4796
- Electrochemical reduction of CO2 catalyzed by Fe-N-C materials: a structure-selectivity study
  Tran Ngoc Huan, Nastaran Ranjbar, Gwenaëlle Rousse, Moulay Sougrati, Andrea Zitolo, Victor Mougel, Frédéric Jaouen, Marc Fontecave
  ACS Catalysis 7 (2017), 1520-1525
- Porous dendritic copper: an electrocatalyst for highly selective CO2 reduction to formate in water/ionic liquids electrolyte
  Tran Ngoc Huan, P. Simon, G. Rousse, I. Génois, V. Artero, M. Fontecave
  Chemical Science 8 (2017), 742-747

2016

- CO2 reduction to CO in water: carbon nanotube-gold nanohybrid as a selective and efficient electrocatalyst
  Tran Ngoc Huan, P. Prakash, P. Simon, G. Rousse, X. Xiangzhen, V. Artero, E. Gravel, E. Doris, M. Fontecave
  ChemSusChem 9 (2016), 2317-2320
- Bio-inspired Nanomaterials Approaching Pt Performances for H2 Evolution and Uptake
  Tran Ngoc Huan, Reuben T. Jane, A. Benayad, Laure Guetaz, Phong. D. Tran , Vincent Artero
  Energy Environmental Science 9 (2016), 940-947.
- Cu/Cu2O electrodes and CO2 reduction to formic acid: Effects of organic additives on surface morphology and activity
  Tran Ngoc Huan, Philippe Simon, Anass Benayad, Laure Guetaz, V. Artero, M. Fontecave
  Chemistry-A European Journal 22 (2016), 14029-14035

2015

- Toehold-mediated DNA displacement-based surface-enhanced Raman scattering DNA sensor utilizing an Au-Ag bimetallic nanodendrite substrate
  Kim, S., Tran Ngoc Huan, Kim, J., Yoo, S.Y., Chung, H.
  Analytica Chimica Acta 885 (2015) 132–139
- From molecular copper complexes to composite electrocatalytic materials for selective reduction of CO2 to formic acid
  Tran Ngoc Huan, Eugen. S. Andreiadis, Jonathan Heidkamp, Philippe Simon, Saioa Cobo, Guy Royal, Holger Dau, Vincent Artero and Marc Fontecave
  Journal of Materials Chemistry A 3 (2015), pp. 3901-3907
- Forest of Pt-Au-Ag tri-metallic nanodendrites as an efficient electrocatalyst for methanol oxidation reaction
  Tran Ngoc Huan, Dipak V. Shinde, Sung-Hwan Han, Vincent Artero, Hoeil Chung

RSC Advances 5 (2015) 6940-6944

2014

- Au–Ag bimetallic nanodendrite synthesized via simultaneous co-electrodeposition and its application as a SERS substrate
  Tran Ngoc Huan, Saetbyeol Kim, Pham Van Tuong and Hoeil Chung
  RSC Advances 4 (2014) 3929-3933

2013

- Direct production of highly conductive graphene with a low oxygen content by a microwave-assisted solvothermal method
  Tran Van Khai, Dong Sub Kwak, Yong Jung Kwon, Tran Ngoc Huan, Hoeil Chung, Chongmu Lee, Hyoun Woo Kim
  Chemical Engineering Journal 232 (2013) 346–355
- Current density enhancement in ZnO/CdSe photoelectrochemical cells in the presence of a charge separating SnO2 nanoparticles interfacing-layer
  Supriya A. Patil, Dipak V. Shinde, Sambhaji S. Bhande, Tran Ngoc Huan, Rajaram S. Mane and Sung-Hwan Han
  Dalton Transactions 42 (2013) 13065-13070
- Label-free detection of aflatoxin M1 with electrochemical Fe3O4/polyanilinebased aptasensor
  Binh Hai Nguyen, Lam Dai Tran, Quan Phuc Do, Huy Le Nguyen, Tran Ngoc Huan, Phuc Xuan Nguyen
  Materials Science and Engineering C 33 (2013) 2229–2234

2012

- Spirally oriented Au microelectrode array sensor for detection of Hg (II)
  Tran Ngoc Huan, Le Quoc Hung, Vu Thi Thu Ha, Tran V. Khai, Kwang Bo Shim, Hoeil Chung.
  Talanta 94 (2012) 284– 288
- Enhancement of quaternary nitrogen doping of graphene oxide via chemical reduction prior to thermal annealing and an investigation of its electrochemical properties
  Tran Ngoc Huan, Tran Van Khai, Kwang Bo Shim, Hoeil Chung
  Journal of Materials Chemistry 22(2012) 14756-14762

2011

- A three-dimensional gold nanodendrite network porous structure and its application for an electrochemical sensing
  Tran Ngoc Huan, Thothadri Ganesh, Kwang Soo Kim, Sung-Hwan Han, Hoeil Chung
  Biosensors and Bioelectronics 27 (2011) 183– 186
- Sensitive detection of an Anthrax biomarker using a glassy carbon electrode with a consecutively immobilized layer of polyaniline/carbon nanotube/peptide
  Tran Ngoc Huan, Thothadri Ganesh, Sung-Hwan Han, Moon-Young Yoon, Hoeil Chung
  Biosensors and Bioelectronics 26 (2011) 4227–4230

2009

- Square wave voltammetric detection of Anthrax utilizing a peptide for selective recognition of a protein biomarker
  Tran Ngoc Huan, Vu. T.T. Ha, Le Quoc Hung, Moon.Y. Yoon, Sung-Hwan Han, Hoeil Chung
  Biosensors and Bioelectronics 25 (2009) 469–474