

FERNANDO VALLEJOS-BURGOS

PERSONAL

- Chilean, born January 3, 1982. Married, no children.
- Spanish speaker as native language. English, fluent (81% Michigan, 2007). Basic Japanese and French.
- Online records: ORCID ID: orcid.org/0000-0002-2262-9868 Publons: publons.com/a/999378/
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EDUCATION

- 2011: Doctor Degree of Engineering Science in Chemical Engineering, Universidad de Concepción, Chile. Thesis title: "Oxygen Transfer on Carbons and Carbon-Supported Catalysts". Supervised by Ljubisa R. Radovic, Alfredo L. Gordon and Ximena García.
- 2006: Professional Title of Chemical Engineer, Universidad de Concepción, Chile.
- 2004: Bachelor Degree in Engineering Science mention Chemical Engineering, Universidad de Concepción.
- 1988-1999: Elementary and High School at Instituto Linares, Linares, Chile.

SKILLS

- Experience in using, fixing and assembling custom analysis laboratory equipment including high-pressure multiphase reactors and vacuum adsorption apparatus. Practical knowledge of machining for construction of research equipment in lathe, drill press and milling machine. Practical and theoretical knowledge of carbons and catalyst surface characterization techniques such as XRD, XPS, IR/Raman, N₂-adsorption, SEM, mass spectrometry, atomic force microscope.
- *Computer skills*: computer hardware assembly, programming (Fortran, C++, Matlab, Octave, Python, Processing, Arduino, TCL), molecular simulation software and operating systems (OSX, Linux).
- *Hobbies*: cycling, tennis and skiing. Mountaineering: ENAM certified Basic Mountaineering and Glacier Travelling courses. Parallel level of skiing. Taekwondo green belt. Telescope astrophotography.

PRESENT ACTIVITIES

- From Apr 2014: Researcher at Center for Energy and Environmental Science, Shinshu University, Japan.
 - Research topics: Fundamentals of adsorption, molecular dynamics and nanoporous membranes. Supervised by Prof. Katsumi Kaneko.
 - Contact: nando-AT-shinshu-u.ac.jp / Office: Tel: + 81-26-269-5742
 - Address: Center for Energy and Environmental Science at Shinshu University. 380-8553, 4-17-1 Wakasato, Nagano, Japan.
- Webmaster Kaneko Group: <http://www.shinshu-u.ac.jp/faculty/engineering/kaneko-group/>

RECENT ACTIVITIES

- 2008-2014: Webmaster Carbons & Catalysts Group, Universidad de Concepción: <http://www.udec.cl/~carbocat>
- 2010-2011: Digitalization of American Carbon Society 1953-1993 conferences.

- 2006-2009: Laboratory assistant, Chemical Engineering Department, Universidad de Concepción on determination of surface area of porous solids, kinetics of the catalyzed decomposition of hydrogen peroxide and heat of combustion of solid organic compounds.
- Feb-Aug 2008: Visiting graduate researcher, Molecular Chemistry Group, Chiba University, Japan. “Characterization of coal-supported catalysts”. Supervised by: Katsumi Kaneko and Ljubisa R. Radovic.

RESEARCH AND WORK EXPERIENCE

- Apr 2013 – Mar 2014: Postdoctoral Researcher at Research Center for Exotic Nanocarbons. Shinshu University, Japan. Topic of study: characterization of nanopores by dynamic multiprobe adsorption. Supervised by: Prof. Katsumi Kaneko.
- Apr 2012 – Mar 2013: Postdoctoral Research Associate at Texas A&M University at Qatar. Experimental research on Fischer-Tropsch synthesis. Supervised by Prof. Dragomir Bukur
- Nov 2011-Feb 2012: Program Aide / Temporary Researcher at Texas A&M University at Qatar: Experimental research on Fischer-Tropsch Synthesis. Supervised by Prof. Dragomir Bukur
- Mar-May 2011: Supporting Researcher, FONDEF Project D08-I-1156 “Diesel fuel and fine chemical products derived from tall oil”.
- 2009: Collaborator in British Petroleum (BP) supported project “Catalyzed gasification of coke”.
- Jul 2001 and Jan - Feb 2002: Technical support to the Production Control Department in the development of a dosifier and automatization of laboratory, IANSA S.A., Linares, Chile.
- Jan 2003: Summer Professional internship: Improvement of CO₂ scrubbers of limestone kilns, at IANSA S.A., Linares, Chile.

HONORS

- 2017: Publons Peer Review Award: Top 1% peer reviewer in both Chem. Engineering and Env. Science.
- 2016: Excellent Poster Award (30th Annual Conference of the Japanese Adsorption Society, Japan).
- 2016: Japanese Carbon Society (TANSO) scholarship for conference attendance (Carbon 2016 in PSU, USA).
- 2016-2018: Reviewer for Journal of Environmental Chemical Engineering.
- 2011-2012: Reviewer for Journal of Applied Electrochemistry and Journal of the Chilean Chemical Society.
- 2010: CONICYT scholarship for international conference attendance (Carbon 2010 in SC, USA).
- 2008: MECESUP scholarship for a 6 months’ research stay at Chiba University, Japan.
- 2007-2010: CONICYT scholarship for doctoral students.

ISI JOURNALS PUBLICATIONS

- **F. Vallejos-Burgos**, FX. Coudert and K. Kaneko. “Air separation with graphene mediated by nanowindow-rim concerted motion” *Nature Communications*, 2018, 9:1812. DOI: 10.1038/s41467-018-04224-6
- N. Chotimah, AD. Putri, Y. Ono, K. Sagisaka, Y. Hattori, S. Wang, R. Futamura, K. Urita, **F. Vallejos-Burgos**, I. Moriguchi, M. Morimoto, R. Cimino, A. Neimark, T. Sakai and K. Kaneko. “Nanoporosity Change on Elastic Relaxation of Partially Folded Graphene Monoliths”. *Langmuir*, 2017, 33(51):14565-14570.
- EZ. Pina-Salazar, K. Urita, T. Hayashi, R. Futamura, **F. Vallejos-Burgos**, J. Włoch, P. Kowalczyk, M. Wiśniewski, T. Sakai, I. Moriguchi, AP. Terzyk, E. Osawa, and K. Kaneko “Water adsorption property of hierarchically nanoporous detonation nanodiamonds” *Langmuir*, 2017, 33(42):11180-11188.
- C. de Tomas, I. Suarez-Martinez, **F. Vallejos-Burgos**, MJ. Lopez, K. Kaneko and NA. Marks. “Structural prediction of graphitization and porosity in carbide-derived carbons” *Carbon*, 2017;119:1-9.

- **F. Vallejos-Burgos**, N. Díaz-Pérez, A. Silva-Villalobos, R. Jiménez, X. García, and LR. Radovic. "On the structural and reactivity differences between carbons derived from coal and biomass". *Carbon*, 2016;109:253-263.
- S. Wang, D. Abraham, **F. Vallejos-Burgos**, K. Laszlo, E. Geissler, K. Takeuchi, M. Endo and K. Kaneko. "Distorted Graphene Sheet Structure-Derived Latent Nanoporosity". *Langmuir*, 2016, 32(22):5617-5622.
- A. Shuhara, A. Kondo, S. Utsumi, H. Tanaka, T. Ohba, H. Kanoh, K. Takahashi, **F. Vallejos-Burgos** and K. Kaneko. "Fabrication of highly ultramicroporous carbon nanofoams by SF₆-catalyzed laser-induced chemical vapor deposition". *Chem. Phys. Lett.*, 2016;652:199-202
- **F. Vallejos-Burgos**, S. Utsumi, Y. Hattori, X. García, AL. Gordon, H. Kanoh, K. Kaneko and LR. Radovic. "Pyrolyzed phthalocyanines as surrogate carbon catalysts: initial insights into oxygen-transfer mechanisms". *Fuel*, 2012; 99:106-17.
- LR. Radovic, A. Suarez, **F. Vallejos-Burgos**, J. O. Sofo. "Oxygen migration on the graphene surface. 2. Thermochemistry of basal-plane diffusion (hopping)". *Carbon*, 2011;49(13):4226-38
- LR. Radovic, AB. Silva-Tapia, **F. Vallejos-Burgos**. "Oxygen migration on the graphene surface. 1. Origin of epoxide groups". *Carbon*, 2011;49(13):4218-25
- LR. Radovic, AF. Silva-Villalobos, AB. Silva-Tapia and **F. Vallejos-Burgos**. "On the Mechanism of Nascent Site Deactivation in Graphene". *Carbon*, 2011;49(11):3471-87
- S. Utsumi, **F. Vallejos-Burgos**, CM. Campos, X. Garcia, AL. Gordon, G. Pecchi and LR. Radovic. "Preparation and characterization of inexpensive heterogeneous catalysts for air pollution control: Two case studies." *Catalysis Today*, 2007;123(1-4):208-17

PRESENTATIONS IN CONFERENCES, SYMPOSIA, ETC

- Nov 2016: 31st Annual Meeting of the Japanese Adsorption Society. Poster: "Molecular Separation with Graphene Nanowindows". Shizuoka, Japan.
- Jul 2017: The World Conference on Carbon 2017. Oral: "Specific Interaction-mediated Efficient separation of molecules through Graphene Nanowindows". Melbourne, Australia.
- Jul 2017: 6th Symposium for Future Challenges for Carbon-Based Nanoporous Materials. Oral: "Molecular separation with graphene nanowindows". Nagano, Japan.
- Feb 2017: 5th Symposium for Future Challenges for Carbon-Based Nanoporous Materials. Oral: "Role(s) of Nanowindow Rim Functional Groups in Molecular Permeation through Graphene". Nagano, Japan.
- Dec 2016: 43rd Annual Meeting of the Japanese Carbon Society. Oral: "Nanowindow-rim assisted Molecular Permeation in Graphene". Chiba, Japan.
- Nov 2016: 30th Annual Meeting of the Japanese Adsorption Society. Poster: "Quasi-wall Effect in Graphene Nanowindows". Nagasaki, Japan.
- Jul 2016: Beyond Adsorption Symposium. Oral: "Towards Real Models of Graphene Nanowindows". City University of New York, USA.
- Jul 2016: The World Conference on Carbon 2016. Oral: "Quasi-wall Effect in Graphene Nanowindows". Penn State University, USA.
- Nov 2015: 29th Meeting of the Japanese Adsorption Society. Oral: "Adsorption Kinetics from Non-equilibrium Isotherms". Tokushima, Japan.
- Sep 2015: 132nd Meeting of the Surface Finishing Society of Japan. Oral: "Penetration process of an Ar atom through a nanowindow on graphene". Nagano, Japan.
- Jul 2015: The World Conference on 2015. Oral: "Nanowindow characterization of single wall carbon nanotubilities by dynamic multimolecular probe adsorption". Dresden, Germany.

- Mar 2015: 4th Symposium for Future Challenges for Carbon-Based Nanoporous Materials. Poster: "Potential Energy Surfaces of Graphene Nanowindows with Different Geometries Predicted by Atomistic Lennard-Jones Interactions". Nagano, Japan.
- Dec 2014: 41st Annual Meeting of the Japanese Carbon Society. Oral: "Nanowindow evaluation of SWCNH with dynamic multimolecular probe adsorption". Fukuoka, Japan.
- Mar 2012: 10th Natural Gas Conversion Symposium. Poster: "Carbidization and reduction pretreatment of Co/Al₂O₃ catalyst for Fischer-Tropsch synthesis". Doha, Qatar.
- Jul 2010: The World Conference on Carbon 2010. Oral: "On the reactivity and structural differences between biomass- and coal-derived chars". Clemson University, USA.
- Oct 2009: XVII Congreso Chileno de Ingeniería Química. Oral: "Acerca de las diferencias estructurales y de reactividad en carbones derivados de carbón mineral y biomasa". Viña del Mar, Chile.
- Nov 2008: V Jornadas Chilenas de Catálisis y Adsorción. Oral: "Efecto de la porosidad del soporte carbonoso en la gasificación con O₂ catalizada por Co y Cu". Talca, Chile.
- Jul 2008: 2nd Symposium for Future Challenges for Carbon-Based Nanoporous Materials. Poster: "Effect of activated carbon textural properties on metal catalytic activity in carbon reactions". Chiba, Japan.
- Jul 2008: The World Conference on Carbon 2008. Poster: "Heat treated phthalocyanines as surrogate carbon catalysts: initial insights into oxygen transfer catalysis". Nagano, Japan.
- Oct 2007: 1000 Científicos, 1000 Aulas, XIII Semana Nacional de la Ciencia y la Tecnología. Oral: "¿Cómo volver a los combustibles de ayer con la tecnología de hoy?", Concepción, Chile.
- Nov 2006: IV Jornadas Chilenas de Catálisis y Adsorción. Oral: "Preparación y caracterización de catalizadores de bajo costo para la reducción de NO", Santiago, Chile.

ATTENDANCE TO EVENTS (WITH NO PRESENTATIONS)

- Nov 2013: "The Japan Society on Adsorption Meeting". Chiba, Japan.
- Jun 2010: "1st Chilean International Seminar on Biogenic Gases as Fuels for the Future", Universidad de Concepción, Chile.
- Aug 2002: "VIII Congreso Latinoamericano Estudiantes Ingeniería Química". Viña del Mar, Chile
- Mar 2007: Seminar "Cromatografía líquida y espectrometría de masas" HPLC – MS/MS, Santiago, Chile.

REFERENCES

- Dr. Ljubisa R. Radovic, The Pennsylvania State University, USA: lrr3-AT-psu.edu
- Dr. Hirofumi Kanoh, Chiba University, Japan: kanoh-AT-pchem2.s.chiba-u.ac.jp
- Dr. Koki Urita, Nagasaki University, Japan: urita-AT-nagasaki-u.ac.jp
- Dr. Alfredo Gordon, Universidad de Concepción, Chile: algordon-AT-udec.cl
- Dr. Ximena García, Universidad de Concepción, Chile: xgarcia-AT-udec.cl