

FERNANDO VALLEJOS-BURGOS

PERSONAL

- Chilean, born January 3, 1982. Married with children.
- Spanish speaker as native language. English, fluent. Basic Japanese and French.
- Online records: ORCID ID: orcid.org/0000-0002-2262-9868 Publons: publons.com/a/999378/
- Contact email: fvb-AT-vallejos.cl — Personal website: <http://www.vallejos.cl>

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 3D printers, lathe, drill press and milling machine. Practical and theoretical knowledge of carbons and catalyst surface characterization techniques such as XRD, XPS, IR/Raman, gas adsorption, SEM, mass spectrometry, atomic force microscope.
- *Computer skills*: computer hardware assembly, programming (Fortran, C++, Matlab, Octave, Python, Processing, Arduino, TCL, LabVIEW), molecular simulation software and operating systems (OSX, Linux, Windows).
- *Hobbies*: cycling, tennis and skiing. Mountaineering: ENAM certified Basic Mountaineering and Glacier Travelling courses. Parallel level of skiing. Taekwondo green belt. Astrophotography.

PRESENT ACTIVITIES

- Materials Scientist at Morgan Advanced Materials, Carbon Science Centre of Excellence.
 - Address: 310 Innovation Blvd. Ste 250, State College, PA 16803, USA.
 - Contact email: Fernando.VallejosBurgos@morganplc.com

RECENT ACTIVITIES

- 2015-2018: Webmaster Kaneko Group: <http://www.shinshu-u.ac.jp/faculty/engineering/kaneko-group/>
- 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 surface area of porous solids, catalyst kinetics, and heat of combustion.
- 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 2014 – Sep 2018: 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.
- 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”.
- Jan 2003: Professional internship: Improvement of CO₂ scrubbers, at IANSA S.A., Linares, Chile.
- 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.

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, USA).
- 2016-2020: 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 (17)

- H. Ito, **F. Vallejos-Burgos**, Y. Ono, M. Yoshimoto, K. Kaneko, R. Futamura, T. Iiyama and A. Matsumoto. “Isotope effect on adsorption diffusivity of water molecules in hydrophobic carbon micropores”. *Carbon*, 2020, 168: 415-418.
- Y. Kamijyou, D. Stevic, R. Kukobat, K. Urita, N. Chotimah, Y. Hattori, R. Futamura, **F. Vallejos-Burgos**, I. Moriguchi, S. Utsumi, T. Sakai and K. Kaneko. “Mesoscopic cage-like structured single-wall carbon nanotube cryogels”. *Microporous and Mesoporous Materials*, 2020, 293: 109814.
- **F. Vallejos-Burgos** and K. Kaneko. “Measuring adsorption isotherms with a flowmeter and a pressure gauge”. *Adsorption*, 2019; 25: 809-817.

- P. Ahuya, S. Akiyama, SK. Ujjain, R. Kukobat, **F. Vallejos-Burgos**, R. Futamura, T. Hayashi, M. Kimura, D. Tomanek and K. Kaneko. "A water-resilient carbon nanotube based strain sensor for monitoring structural integrity" *Journal of Materials Chemistry A*, 2019, 7, 19996-20005.
- AD. Putri, N. Chotimah, SK. Ujjain, S. Wang, R. Futamura, **F. Vallejos-Burgos**, F. Khoerunnisa, M. Morimoto, Z. Wang, Y. Hattori, T. Sakai and K. Kaneko. "Charge-transfer mediated nanopore-controlled pyrene derivatives/graphene colloids" *Carbon*, 2018;138:512-521.
- **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

- July 2019: World Conference on Carbon 2019 Poster "Challenges in Graphene Nanopore-(Nanowindoe)-based Molecular Separations: A Critical Review". Kentucky, USA.
- Sep 2018: 69th Meeting of the Division of Colloid and Surface Chemistry. Oral: "Role of Graphene Heteroatomic Defects in Future Separation Processes". Tsukuba, Japan.
- Sep 2018: 8th Pacific Basin Conference on Adsorption Science and Technology. PBAST-8. Oral: "Consequences of Heterogeneities for Adsorption on Graphene". Sapporo, Japan.

- Aug 2018: International Symposium of Surface Heterogeneity in Adsorption. ISSHAC-10 Oral: "Consequences of Basal Plane Heterogeneities for Adsorption and Permeation in Graphene". Lublin, Poland
- Aug 2018: ISSHAC-10 Poster: "Adsorption kinetics from non-equilibrium isotherms". Lublin, Poland
- Jul 2018: World Conference on Carbon 2018 "Molecular Behavior near Graphene Nanowindows". Madrid, Spain
- Nov 2017: 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 Carbon 2015. Oral: "Nanowindow characterization of single wall carbon nanotubulites 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 carbonos 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 (WITHOUT 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”, 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