

PROFESSIONAL SKILLS

- Organic Synthesis
- Porous Materials
- Characterisation Techniques
- X-Ray Crystallography

EDUCATION

Oct.2015/Dec.2019 _ Catalan Institute of Nanoscience and Nanotechnology (ICN2)

- PhD Student/researcher at the Catalan Institute of Nanoscience and Nanotechnology (ICN2) Supramolecular Nanochemistry and Materials Group (Nano^{UP})
Thesis Title: Post-Synthetic modification of Metal-Organic Frameworks (MOFs) and Polyhedra (MOPs)
Awarded with Cum Laude Honors and the UAB Extraordinary Award 2019/20

Sep.2014/Sep.2015 _ Autonomous University of Barcelona (UAB)

- Master's Degree with Honors in Industrial Chemistry and Introduction to Chemical Research
Small Molecules and Nanomaterials specialisation

Sep.2010/Sep.2014 _ Autonomous University of Barcelona (UAB)

- Bachelor's Degree with Honors in Chemistry – Extraordinary Award
Chemistry of Materials Specialization

EXTRA-ACADEMIC FORMATION

- Delivery workshop for staff: Educational theory behind student engagements (2021), Adelaide, Australia
- Rigaku Online School of Practical Crystallography (2020), Adelaide, Australia
- Manuel Rico Summer School in Advanced NMR Techniques (2019), Jaca, Spain
- Perkin Elmer Advanced Course in Thermal and Gravimetric Analyses (2018), Bellaterra, Spain
- Introduction to Structural Resolution via Single-Crystal X-Ray Diffraction (2017), Badajoz, Spain

GRANTS AND AWARDS

- Extraordinary Award for PhD Theses in Chemistry 2019/2020 – Autonomous University of Barcelona
- FI-AGAUR PhD Fellowship (Mar.2016/Feb.2019) – Generalitat de Catalunya
- Excellence award Master Theses in Chemistry - Fundació "La Pedrera"
- Extraordinary Award for Chemistry 2010/2014 – Autonomous University of Barcelona

CONFERENCES AND PRESENTATIONS

- MOF2022: 8th International Conference on Metal-Organic Frameworks and Open Framework Compounds (2022), Dresden, Germany (Oral lecture)
- IC21 – RACI Inorganic Chemistry Group Virtual Symposium (2022), Online Conference, Australia (Oral)
- RACI Supramolecular Chemistry Group Virtual Symposium (2021), Online Symposium, Australia (Oral)
- XXXVII Bienal of the Spanish Royal Society of Chemistry (RSEQ) (2019), Donosti, Spain (Oral)
- Jornades Doctorals de la UAB (2018), Bellaterra, Spain (Oral)
- XXXVI Bienal of the Spanish Royal Society of Chemistry (RSEQ) (2017), Sitges, Spain (Poster)

PROFESSIONAL EXPERIENCE

Jun.2022/Present _ Catalan Institute of Nanoscience and Nanotechnology

- ERC-funded Postdoctoral Researcher at Supramolecular Nanochemistry and Materials Group (NanoUP)

Mar.2020/Apr.2022 _ The University of Adelaide

- ARC-funded Postdoctoral Researcher at the Sumbly-Doonan Group
School of Physical Sciences, Department of Chemistry – The University of Adelaide, Adelaide, SA 5000, Australia

Feb.2015/Dec.2019 _ Catalan Institute of Nanoscience and Nanotechnology (ICN2)

- PhD Student/Researcher at Supramolecular Nanochemistry and Materials Group (Nano^{UP})
- Research assistant at the Supramolecular Nanochemistry and Materials Group (Nano^{UP}) (Master Thesis Internship)

Jan.2014/Sep.2014 _ PPG Ibérica Industries

- Laboratory Assistant/Technician at the Adhesives & Industrial Coatings Department
Rubí (Barcelona), Spain

DEVELOPED SKILLS

Organic Chemistry

- Design and retrosynthesis of organic linkers for MOFs/MOPs Chemistry
- Organic solid/liquid and solid/gas Post-Synthetic modification of MOFs/MOPs
- Chromatographic separation and purification techniques
- Distillation and drying techniques for organic solvents
- Operation under standard inert atmosphere – Schlenk/Glove box

Characterisation Techniques

- XRD (PXRD/SCXRD) – Oxford/Rigaku, Electron Microscopy (SEM, TEM), TGA, Mass-Spectrometry (ESI-MS/MALDI-TOF), 1D-2D NMR, FTIR, UV-Vis, magnetic susceptibility, ICP-OES/MS, gas sorption, Synchrotron user experience (Alba Synchrotron: XALOC beamline, Australian Synchrotron: MX1-MX2 beamlines).
- Solid/Gas-phase NMR

Coordination Chemistry

- Hydro/solvothermal synthesis
- Crystallisation/Co-crystallisation techniques
- Reticular Chemistry
- Post-synthetic metalation of Metal-Organic Frameworks and ion/ligand exchange techniques under reactive gas atmosphere.
- Solid/gas phase reactivity, catalysis

Student Supervision / Mentoring

- Co-mentoring and supervision of undergraduate, PPR, masters, and PhD students.
 - ICN2: Laura Hernández (undergrad, master), Paula Mendoza (undergrad)
 - UofA: Suet Yee Too (Undergrad), Joe Milne (PPR), Steven Tsoukatos (Master), Pol Gimeno (PhD), Zi Goh (summer student)

Data Treatment Softwares

- Origin, MS-Office, MestReNova, ChemDraw, X'Pert Highscore, Mercury, Diamond, CrystalMaker, Fit2D, WinGX, Olex, XSeed, Pyris, OPUS

Miscellaneous Software

Adobe Photoshop, Blender 2.X – 3.X 3D modelling

Manuscript Redaction

- 17 peer-reviewed high-impact journal publications

Peralta, R. A.; Huxley, M. T.; **Albalad, J.**; Doonan, C. J.; Sumbly, C. J., "Solid-state isolation of reactive complexes in a metal–organic framework matrix" *Acta Cryst. Section A*, **2021**, A77, C64.

Albalad, J.*; Hernández-López, L.; Carné-Sánchez, A.; Maspoch, D.; "Surface Chemistry of Metal-Organic Polyhedra (MOPs)" *Chem. Commun.*, **2022**, 58, 2443-2454 (*: corresponding author)

Khobotov, A.; Hernández-López, L.; von Baeckmann, C.; **Albalad, J.**; Carné-Sánchez, A.; Maspoch, D.; "Metal-Organic Polyhedra as Building Blocks for Porous Extended Networks", *Adv. Sci.*, **2022**, e2104753.

Gimeno-Fonquernie, P.; Liang, W.; **Albalad, J.**; Kuznicki, A.; Price, J.; Bloch, E. D.; Doonan, C. J.; Sumbly, C. J., "Templated synthesis of Zirconium(IV)-based metal-organic layers (MOLs) with accessible chelating sites", *Chem. Commun.*, **2022**, 58, 957-960.

Albalad, J.; Peralta, R. A.; Huxley, M. T.; Tsoukatos, S.; Zhaolin, X.; Zhang, Y. B.; Sumbly, C. J.; Doonan, C. J.; "Coordination Modulated On-Off Switching of Flexibility in a Metal-organic Framework" *Chem. Sci.*, **2021**, 12, 14893-14900.

Peralta, R. A.; Huxley, M. T., **Albalad, J.**; Sumbly, C. J.; Doonan, C. J.; "Single-crystal to Single-crystal transformations of MOF-supported, site-isolated trigonal planar Cu (I) complexes with labile ligands" *Inorg. Chem.*, **2021**, 60, 11775–11783.

Albalad, J.*; Sumbly, C. J.; Maspoch, D.; Doonan, C. J. "Elucidating pore chemistry within Metal-Organic Frameworks via Single Crystal X-Ray Diffraction; from fundamental understanding to application" *Cryst. Eng. Comm.*, **2021**, 23, 2185-2195. (*: corresponding author)

Grancha, T.; Carné-Sánchez, A.; Zarekarizi, F.; Hernández-López, L.; **Albalad, J.**; Khobotov, A.; Guillerm, V.; Morsali, A.; Juanhuix, J., Gándara, F.; Imaz, I.; Maspoch, D. "Synthesis of Polycarboxylate Rhodium (II) Metal–Organic Polyhedra (MOPs) and their use as Building Blocks for Highly Connected Metal–Organic Frameworks (MOFs)" *Angew. Chemie Int. Ed.*, **2021**, 60, 5729-5733.

Grancha, T.; Carné-Sánchez, A.; Hernández-López, L.; **Albalad, J.**; Maspoch, D. "Phase Transfer of Rhodium(II)-Based Metal-Organic Polyhedra Bearing Coordinatively-Bound Cargo Enables Molecular Separation" *J. Am. Chem. Soc.*, **2019**, 141, 18349-18355.

Albalad, J.; Carné-Sánchez, A.; Grancha, T.; Hernández-López, L.; Maspoch D. "Protection strategies for directionally-controlled synthesis of previously inaccessible metal–organic polyhedra (MOPs): the cases of carboxylate- and amino-functionalised Rh(II)-MOPs" *Chem. Commun.*, **2019**, 55, 12785-12788.

Carné-Sánchez, A.†; **Albalad, J.†**; Grancha, T.†; Imaz, I.; Juanhuix, J.; Larpent, P.; Furukawa, S.; Maspoch, D. "Postsynthetic Covalent and Coordination Functionalization of Rhodium(II)-Based Metal–Organic Polyhedra" *J. Am. Chem. Soc.*, **2018**, 141, 4094-4102. (†: coauthorship)

Guillerm, V.; Xu, H.; **Albalad, J.**; Imaz, I.; Maspoch, D. "Postsynthetic Selective Ligand Cleavage by Solid–Gas Phase Ozonolysis Fuses Micropores into Mesopores in Metal–Organic Frameworks" *J. Am. Chem. Soc.*, **2018**, 140, 15022-15030.

Albalad, J.; Xu, H.; Gándara, F.; Haouas, M.; Martineau-Corcos, C.; Mas-Ballesté, R.; Barnett, S.A.; Juanhuix, J.; Imaz, I.; Maspoch, D. "Single-Crystal-to-Single-Crystal Postsynthetic Modification of a Metal–Organic Framework via Ozonolysis" *J. Am. Chem. Soc.*, **2018**, 140, 2028-2031.

Albalad, J.; Arriñez-Soriano, J.; Vidal-Gancedo, J.; Lloveras, V.; Juanhuix, J.; Imaz, I.; Maspoch D. "Hetero-bimetallic paddlewheel clusters in coordination polymers formed by a water-induced single-crystal-to-single-crystal transformation" *Chem. Commun.*, **2016**, 52, 13397-13400.

Arriñez-Soriano, J.; **Albalad, J.**; Carné-Sánchez, A.; Bonnet, C.S.; Busqué, F.; Lorenzo, J.; Juanhuix, J.; Terban, M.W.; Imaz, I.; Tóth, E.; Maspoch, D. "pH-Responsive Relaxometric Behaviour of Coordination Polymer Nanoparticles Made of a Stable Macrocyclic Gadolinium Chelate" *Chem. Eur. J.*, **2016**, *22*, 13162-13170.

Arriñez-Soriano, J.; **Albalad, J.**; Vila-Parrondo, C.; Pérez-Carvajal, J.; Rodríguez-Hermida, S.; Cabeza, A.; Juanhuix, J.; Imaz, I.; Maspoch, D. "Single-crystal and humidity-controlled powder diffraction study of the breathing effect in a metal-organic framework upon water adsorption/desorption" *Chem. Commun.*, **2016**, *52*, 7229-7232.

Arriñez-Soriano, J.; **Albalad, J.**; Pérez-Carvajal, J.; Imaz, I.; Busqué, F.; Juanhuix, J.; Maspoch, D. "Two-step synthesis of heterometallic coordination polymers using a polyazamacrocyclic linker" *Cryst. Eng. Comm.* **2016**, *22*, 4196-4204.