

## Santiago Esteban Herrera

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### Summary:

<b>Scientific</b>	<b>Electrochemistry:</b> Electron transfer at electrode interfaces, energy conversion and storage, Li/Air batteries, electrochemical impedance spectroscopy. <b>Soft Matter:</b> Supramolecular self-assembly in solution and surfaces. Layer-by-layer films, polyamine-salt aggregates formation by supramolecular cross-linking, drug delivery and controlled release. Multistimuli-responsive nanomaterials. <b>Microscopy:</b> Atomic force microscopy, scanning tunneling microscopy in liquid environment.
<b>Soft Skills</b>	Good adaptation, team work, systematic work, creativity, organization and critical thinking.
<b>Languages</b>	Oral and written English.

### Academics:

1999-2003	Bachelor degree at Instituto Cultural Educacional Don Zeno (Argentina) Chemical Technician degree at Instituto Cultural Educacional Don Zeno (Argentina)
2003-2013	Licentiate degree in Chemical Sciences (complete). Faculty of Exact and Natural Sciences (University of Buenos Aires, Argentina)
2013-2018	PhD in Inorganic Chemistry, Analytical Chemistry and Physical Chemistry at University of Buenos Aires.  Thesis title: <i>Physicochemical studies at nanostructured surfaces</i> . PhD advisor: Dr. Ernesto Julio Calvo.  Institute of Physical Chemistry of Materials, Environment and Energy (INQUIMAE/CONICET, Argentina)
2018-present	Postdoc at Soft Matter Lab, Institute of Theoretical and Applied Physical-Chemical Research (INIFTA/CONICET, La Plata, Argentina).  <i>Rational design of self-assembled multilayers layer-by-layer for controlled release of therapeutic drugs</i> .  Postdoc advisor: Dr. Omar Azzaroni. Postdoc co-advisor: Dr. Mario Tagliacucchi.

## Teaching:

2012-2013	General Inorganic Chemistry (Buenos Aires University): Second assistant. Department of Inorganic Chemistry, Analytical Chemistry and Physical Chemistry, Faculty of Exact and Natural Sciences, UBA.
2013-2014	Analytical Chemistry (Buenos Aires University): Head of chemical preparation laboratory (first assistant). Department of Inorganic Chemistry, Analytical Chemistry and Physical Chemistry, Faculty of Exact and Natural Sciences, UBA.
2019-present	University tutorship program for 1st year students: First assistant. Department of Extension, Scientific Culture and Welfare, Faculty of Exact and Natural Sciences, UBA.

## Extension activities:

2012-present	Academic support for beneficiaries of the Sadosky Scholarship program at the Faculty of Exact and Natural Sciences, UBA. Department of Extension, Scientific Culture and Welfare.
2017-present	Techniques and Study Habits at UBA: First assistant. Teaching and design of workshops for students of the Faculty of Exact and Natural Sciences. Department of Extension, Scientific Culture and Welfare.

## Publications:

- 1- Herrera, S. E.; Agazzi, M. L.; Cortez, M. L.; Marmisollé, W. A.; Tagliacruzchi, M.; Azzaroni, O. Redox-active polyamine-salt aggregates as multistimuli-responsive soft nanoparticles. *PCCP* **2020**, *22*, 7440-7450.
- 2- Agazzi, M. L.; Herrera, S. E.; Cortez, M. L.; Marmisollé, W. A.; Azzaroni, O. Self-Assembled Peptide Dendrigraft Supraparticles with Potential Application in PH/Enzyme-Triggered Multistage Drug Release. *Colloids Surfaces B Biointerfaces* **2020**, *190*, 110895.
- 3- Agazzi, M. L.; Herrera, S. E.; Cortez, M. L.; Marmisollé, W. A.; Tagliacruzchi, M.; Azzaroni, O. Insulin Delivery from Glucose-Responsive, Self-Assembled, Polyamine Nanoparticles: Smart "Sense-and-Treat" Nanocarriers Made Easy. *Chem. – A Eur. J.* **2020**, *26* (11), 2456–2463.
- 4- Herrera, S. E.; Agazzi, M. L.; Cortez, M. L.; Marmisollé, W. A.; Tagliacruzchi, M.; Azzaroni, O. Multitasking Polyamine/Ferrioxalate Nano-Sized Assemblies: Thermo-, Photo-, and Redox-Responsive Soft Materials Made Easy. *Chem. Commun.* **2019**, *55* (97), 14653–14656
- 5- Herrera, S. E.; Agazzi, M. L.; Cortez, M. L.; Marmisollé, W. A.; Azzaroni, O. Layer-by-layer formation of polyamine-salt aggregate multilayer. Loading and controlled release of probe molecules from assembled supramolecular networks. *J. Macromol. Chem. Phys.* **2019**, *220* (15), 1900094.
- 6- Davia, F. G.; Herrera, S. E.; Calvo, E. J. Gaussian Distribution of Electron Transfer Distance in Redox Terminated Self-Assembled Thiol Monolayers. *J. Phys. Chem. C.* **2019**, *123* (22), 13939–13943.
- 7- Herrera, S. E.; Davia, F. G.; Williams, F. J.; Calvo, E. J. Metal Nanoparticle Enhancement of Electron Transfer to Tethered Redox Centers through Self-Assembled Molecular Films. *Langmuir* **2019**, *35* (19), 6297–6303.
- 8- Herrera, S. E.; Agazzi, M. L.; Cortez, M. L.; Marmisollé, W. A.; Tagliacruzchi, M.; Azzaroni, O. Polyamine Colloids Cross-Linked with Phosphate Ions: Towards Understanding the Solution Phase Behavior. *ChemPhysChem* **2019**, *20* (8), 1044–1053.
- 9- Agazzi, M. L.; Herrera, S. E.; Cortez, M. L.; Marmisollé, W. A.; von Bilderling, C.; Pietrasanta, L. I.; Azzaroni, O. Continuous Assembly of Supramolecular Polyamine–Phosphate Networks on Surfaces: Preparation and Permeability Properties of Nanofilms. *Soft Matter* **2019**, *15* (7), 1640–1650.

10- Herrera, S.; Tasca, F.; Williams, F. J.; Calvo, E. J. Adsorption of 4,4'-Dithiodipyridine Axially Coordinated to Iron(II) Phthalocyanine on Au(111) as a New Strategy for Oxygen Reduction Electrocatalysis. *ChemPhysChem* **2018**, *19* (13), 1599–1604.

11- Herrera, S.; Tasca, F.; Williams, F. J.; Calvo, E. J.; Carro, P.; Salvarezza, R. C. Surface Structure of 4-Mercaptopyridine on Au(111): A New Dense Phase. *Langmuir* **2017**, *33* (38), 9565–9572.

12- del Pozo, M.; Torres, W. R.; Herrera, S. E.; Calvo, E. J.; del Pozo, M.; Torres, W. R.; Herrera, S. E.; Calvo, E. J. New Evidence of LiO<sub>2</sub> Dismutation in Lithium-Air Battery Cathodes. *ChemElectroChem* **2016**, *3* (10), 1537–1540.

13- de la Llave, E.; Herrera, S. E.; Adam, C.; Méndez De Leo, L. P.; Calvo, E. J.; Williams, F. J. Molecular and Electronic Structure of Osmium Complexes Confined to Au(111) Surfaces Using a Self-Assembled Molecular Bridge. *J. Chem. Phys.* **2015**, *143* (18), 184703.

14- Torres, W. R.; Herrera, S. E.; Tesio, A. Y.; del Pozo, M.; Calvo, E. J. Soluble TTF Catalyst for the Oxidation of Cathode Products in Li-Oxygen Battery: A Chemical Scavenger. *Electrochim. Acta* **2015**, *182*, 1118–1123.

15- Marchini, F.; Herrera, S. E.; Calvo, E. J.; Williams, F. J. Surface Studies of Lithium-Oxygen Redox Reactions over HOPG. *Surf. Sci.* **2016**, *646*, 154–159.

16- Marchini, F.; Herrera, S.; Torres, W.; Tesio, A. Y.; Williams, F. J.; Calvo, E. J. Surface Study of Lithium Air Battery Oxygen Cathodes in Different Solvent Electrolyte Pairs. *Langmuir* **2015**, *31* (33), 9236–9245.

17- Herrera, S.; Adam, C.; Ricci, A.; Calvo, E. J. Electrochemical Gating of Single Osmium Molecules Tethered to Au Surfaces. *J. Solid State Electrochem.* **2016**, *20* (4), 957–967.

18- de la Llave, E.; Herrera, S. E.; Méndez De Leo, L. P.; Williams, F. J. Molecular and Electronic Structure of Self-Assembled Monolayers Containing Ruthenium(II) Complexes on Gold Surfaces. *J. Phys. Chem. C* **2014**, *118* (37), 21420–21427.

19- Herrera, S. E.; Tesio, A. Y.; Clarenc, R.; Calvo, E. J. AFM Study of Oxygen Reduction Products on HOPG in the LiPF<sub>6</sub>–DMSO Electrolyte. *Phys. Chem. Chem. Phys.* **2014**, *16* (21), 9925.

20- Peinetti, A. S.; Herrera, S.; González, G. A.; Battaglini, F. Synthesis of Atomic Metal Clusters on Nanoporous Alumina. *Chem. Commun.* **2013**, *49* (96), 11317–11319.

## National and International workshops:

“Productos de reducción de oxígeno para cátodos de baterías de Li-aire sobre HOPG conteniendo LiPF<sub>6</sub> en DMSO”

Congreso de la Sociedad Iberoamericana de Electroquímica (SIBAE) – Oral - **2014**, Chile.

“Caracterización electroquímica y morfológica de superficies monocristalinas de Fe<sub>3</sub>O<sub>4</sub> preparadas en ultra alto vacío” XIX Congreso Argentino de Físicoquímica y Química Inorgánica – Oral - **2015**, Argentina.

“New evidence of lithium superoxide dismutation in lithium-air battery cathodes” 3rd International Workshop on Lithium, Industrial Minerals and Energy – Oral - **2016**, Argentina.

“Electron transfer across C16 hexadecanethiol/Au(111) to tethered Os(bpy)<sub>2</sub>(pyCH<sub>2</sub>NH<sub>2</sub>)Cl centers enhanced by Au nanoparticles” 69th annual meeting of the international society of electrochemistry – Poster, presented by Ernesto Calvo – **2018**, Italia.

“Transferencia de carga asistida por nanopartículas de oro depositadas sobre SAM de C16 hexadecanotiol/Au(111)” XXIII Congreso Sociedad Iberoamericana de Electroquímica – Oral. Presented by Ernesto Calvo – **2018**, Perú.