

Part A. PERSONAL INFORMATION**CV date** 10.04.2023

First name	Juan José		
Family name	Calvente Pacheco		
Gender (*)		Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail		URL Web	
Open Researcher and Contributor ID (ORCID) (*)			

(*) *Mandatory***A.1. Current position**

Position	Full Professor		
Initial date	21.12.2017		
Institution	University of Sevilla		
Department/Center	Physical Chemistry		
Country	Spain	Teleph. number	955.42.10.02 Ext. 40123
Key words	Interfacial Electrochemistry, Modified Electrodes, Bioelectrocatalysis, Electrochemical Molecular Recognition, Digital Simulation		

A.2. Previous positions (research activity interruptions, art. 14.2.b))

Period	Position/Institution/Country/Interruption cause
1997-2000	Assistant Professor, University of Sevilla, Spain
2000-2017	Associate Professor, University of Sevilla, Spain
2017-	Full Professor, University of Sevilla, Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Licensed (Chemistry)	Sevilla	1989
PhD (Chemistry)	Sevilla	1994

Part B. CV SUMMARY (*max. 5000 characters, including spaces*)

I got the B.S. degree in Chemistry from the University of Sevilla in 1989, and I was awarded a Ph. D. in Physical Chemistry from the University of Sevilla in 1994 by an study of the coupling between adsorption, electron transfer and homogeneous chemical reactions in the electrochemical response of an electroactive species. From 1995 to 1996, I did a two years post-doctoral stage in the University of California at Davis (USA), where I started to work with chemically modified electrodes. In 1997, I returned to the University of Sevilla as an Assistant Professor, where I continued working in the electrochemical characterization of thiol self-assembled monolayers. In 2000, I became Associate Professor, and then promoted to Full Professor in 2017. During 2003-2004, I spent two short stays in The European Synchrotron Radiation Facility (Grenoble) and the Hasylab (Hamburg), to study the impact of the solvent on the structure of thiol self-assembled monolayers.

I am co-author of 80 peer-reviewed papers (some of them have been published in high-impact journals such as *Angewandte Chemie*, *Journal of the American Chemical Society*, *ACS Catalysis*, *ACS Applied Materials & Interfaces*, *Journal of Physical Chemistry Letters*, and *Analytical Chemistry*), 5 chapters in specialized books, and 78 contributions to workshops and symposia. I am a usual reviewer for different journals such as *Journal of Physical Chemistry*, *Langmuir*, *Inorganic Chemistry*, *Electrochimica Acta*, and *Journal of Electroanalytical*

Chemistry among others. I have participated in 21 research projects (5 as principal investigator).

The main scientific achievements of my research are:

- a) Identification of the individual processes that lead to the formation of thiol self-assembled monolayers on metallic electrodes.
- b) Development of a theoretical analysis to quantify the adsorption parameters of an electroactive species from its stripping voltammetric response.
- c) Quantification of the factors that control the interfacial electron transfer in self-assembled monolayers.
- d) Development of the theory for the quantification of the electric field-induced interfacial proton transfer of ionizable self-assembled monolayers.
- e) Development of a variant of the classical covalent immobilization protocol of proteins that has improved the electrocatalytic activity and chemical resistance of peroxidases.
- f) Identification of two catalytic cycles and a Fenton-like inactivation for peroxidase-based electrocatalysis.
- g) Quantification of the electrocatalytic response of enzymes immobilized in 2D and 3D scaffolds.
- h) Development of a theoretical approach to quantify binding events in proton-coupled electron transfers of immobilized electroactive species from their voltammetric response.
- i) Improvement of the electrocatalytic performance of metal-organic frameworks for the oxygen evolution reaction by means of their electrochemical activation.

My scientific interest in the mid- to long-term is to identify and quantify the factors that control the interfacial electron transfer of proteins and their biomimetics immobilized at electrodes, and the use of nanostructured materials to improve the electrocatalytic response of electrodes modified with enzymes, metal-organic frameworks and multifunctional nanoparticles, to boost strategic reactions for biosensors and energy conversion.

I am a member of the Network of Excellence "*Electrochemical Sensors and Biosensors*"

I have supervised 4 MSc Thesis: three of these graduate students have done PhD Thesis.

I have supervised 4 PhD Thesis: two of these PhD students are now Associate Professors at the Universities of Cadiz and Sevilla, one is Assistant Professor at the University of Sevilla, and one is High School Teacher.

I am teaching in the Master program "*Advanced Studies in Chemistry*" of the University of Sevilla (from the 2006/07 academic course to the present).

I am teaching in the interuniversity Master program "*Electrochemistry. Science and Technology*" (academic courses: 2016/17, 2017/18, 2020/21, 2021/22, 2022/23).

I have coordinated in the University of Sevilla the interuniversity PhD program "*Electrochemistry. Science and Technology*" (academic courses: 2014/15, 2015/16, 2018/19, 2019/20, 2022/23).

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions)

- **Authors:** S. Gutiérrez-Tarriño, A. Portorreal-Bottier, S. Trasobares, J. J. Calvente, J. J. Calvino, J. L. Olloqui-Sariego, P. Oña-Burgos
Title: *Understanding the Potential-Induced Activation of a Cobalt MOF Electrocatalyst for the Oxygen Evolution Reaction*
Journal: *Applied Surface Science* **2023**, 623, 157001. I. F. (JCR 2021): 7.392 (Q1/D1)
- **Authors:** A. Portorreal-Bottier, S. Gutiérrez-Tarriño, J. J. Calvente, R. Andreu, E. Roldán, P. Oña-Burgos, J. L. Olloqui-Sariego
Title: *Enzyme-Like Activity of Cobalt-MOF Nanosheets for Hydrogen Peroxide Electrochemical Sensing*
Journal: *Sensors And Actuators B* **2022**, 368, 132129. I. F. (JCR 2021): 9.221 (Q1/D1)

- **Authors:** I. Márquez, J. L. Olloqui-Sariego, M. Molero, R. Andreu, E. Roldán, J. J. Calvente
Title: *Active Role of the Buffer in the Proton-Coupled Electron Transfer of Immobilized Iron Porphyrins*
Journal: *Inorganic Chemistry* **2021**, 60, 42-54. **I. F.** (JCR 2021): 5.436 (Q1)
 *This paper has been selected by the Editor for the front cover of issue 1 of volume 60 at no cost.

- **Authors:** J. L. Olloqui-Sariego, R. Andreu, J. J. Calvente
Title: *Immobilizing Redox Enzymes at Mesoporous and Nanostructured Electrodes*
Journal: *Current Opinion in Electrochemistry* **2021**, 26, 100658 (8 pages).
I. F. (JCR 2020): 7.271 (Q1)
 *This paper has been selected by the Editor for the front cover of the issue April 2021 of volume 26 at no cost.

- **Authors:** S. Gutiérrez-Tarriño, J. L. Olloqui-Sariego, J. J. Calvente, G. Mínguez Espallargas, F. Rey, A. Corma, P. Oña-Burgos
Title: *Cobalt Metal-Organic Framework Based on Layered Double Nanosheets for Enhanced Electrocatalytic Water Oxidation in Neutral Media*
Journal: *Journal of the American Chemical Society* **2020**, 142, 19198-19208.
I. F. (JCR 2020): 15.419 (Q1/D1)

- **Authors:** S. Gutiérrez-Tarriño, J. L. Olloqui-Sariego, J. J. Calvente, M. Palomino, G. Mínguez Espallargas, J. L. Jordá, F. Rey, P. Oña-Burgos
Title: *Cobalt Metal-Organic Framework Based on Two Dinuclear Secondary Building Units for Electrocatalytic Oxygen Evolution*
Journal: *ACS Applied Materials & Interfaces* **2019**, 11, 46658-46665.
I. F. (JCR 2019): 8.758 (Q1)

- **Authors:** J. L. Olloqui-Sariego, G. S. Zakharova, A. A. Poloznikov, J. J. Calvente, D. M. Hushpulian, L. Gorton, R. Andreu
Title: *The Fe(III)/Fe(II) Redox Couple as a Probe of Immobilized Tobacco Peroxidase: Effect of Immobilization Protocol*
Journal: *Electrochimica Acta* **2019**, 299, 55-61. **I. F.** (JCR 2019): 6.215 (Q1)

- **Authors:** J. L. Olloqui-Sariego, A. Diaz-Quintana, M. A. De la Rosa, J. J. Calvente, I. Márquez, I. Diaz-Moreno, R. Andreu
Title: *Protein Crosslinking Improves the Thermal Resistance of Plastocyanin Immobilized on a Modified Gold Electrode*
Journal: *Bioelectrochemistry* **2018**, 124, 127-132. **I. F.** (JCR 2018): 4.474 (Q1)

- **Authors:** J. J. Calvente, R. Andreu
Title: *Intermolecular Interactions in Electroactive Thiol Monolayers Probed by Linear Scan Voltammetry*
Journal: *Current Opinion in Electrochemistry* **2017**, 1, 22-26. **I. F.** (JCR 2019): 5.579 (Q1)

- **Authors:** J. L. Olloqui-Sariego, G. S. Zakharova, A. A. Poloznikov, J. J. Calvente, D. M. Hushpulian, L. Gorton, R. Andreu
Title: *Fenton-like Inactivation of Tobacco Peroxidase Electrocatalysis at Negative Potentials*
Journal: *ACS Catalysis* **2016**, 6, 7452-7457. **I. F.** (JCR 2016): 10.614 (Q1/D1)

- **Authors:** J. L. Olloqui-Sariego, G. S. Zakharova, A. A. Poloznikov, J. J. Calvente, D. M. Hushpulian, L. Gorton, R. Andreu
Title: *Interprotein Coupling Enhances the Electrocatalytic Efficiency of Tobacco Peroxidase Immobilized at a Graphite Electrode*
Journal: *Analytical Chemistry* **2015**, 87, 10807-10814. **I. F.** (JCR 2015): 5.886 (Q1/D1)

- **Authors:** L. Olloqui-Sariego, B. Moreno-Beltrán, A. Díaz-Quintana, M. A. De la Rosa, J. J. Calvente, R. Andreu
Title: *Temperature-Driven Changeover in the Electron-Transfer Mechanism of a Thermophilic Plastocyanin*

Journal: *Journal of Physical Chemistry Letters* **2014**, 5, 910-914.
I. F. (JCR 2014): 7.458 (Q1/D1)

- **Authors:** J. J. Calvente, A. M. Luque, R. Andreu, W. H. Mulder, J. L. Olloqui-Sariego
Title: *Analytical Expressions for Proton Transfer Voltammetry: Analogy to Surface Redox Voltammetry with Frumkin Interactions*
Journal: *Analytical Chemistry* **2013**, 85, 4475-4482. **I. F. (JCR 2013):** 5.825 (Q1/D1)
 - **Authors:** J. J. Calvente, M. Molero, R. Andreu, G. López-Pérez, A. M. Luque
Title: *Diffusional Surface Voltammetry as a Probe of Adsorption Energetics*
Journal: *Analytical Chemistry* **2012**, 84, 1034-1041. **I. F. (JCR 2012):** 5.695 (Q1/D1)
 - **Authors:** A. M. Luque, W. H. Mulder, J. J. Calvente, A. Cuesta, R. Andreu
Title: *Proton Transfer Voltammetry at Electrodes Modified with Acid Thiol Monolayers*
Journal: *Analytical Chemistry* **2012**, 84, 5778-5786. **I. F. (JCR 2012):** 5.695 (Q1/D1)
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C.2. Congress

- **Authors:** I. Márquez, J. L. Olloqui-Sariego, M. Molero, R. Andreu, E. Roldán, G. López-Pérez, J. J. Calvente
Title: *Cuantificación de la Interacción de la Hemina-Propionato: Implicaciones para la Formación del Pigmento de la Malaria*
 - **Congress:** *XLII Reunión del Grupo Especializado de Electroquímica de la RSEQ (2022, Santander, España)* **Contribution:** Oral Communication
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- **Authors:** S. Gutiérrez-Tariñon, J. L. Olloqui-Sariego, J. J. Calvente, G. Mínguez-Espallargas, F. Rey, A. Corma, P. Oña-Burgos
Title: *2D-Cobalt MOF based on Layered Nanosheets for Superior Electrocatalytic Water Oxidation in Neutral Media*
 - **Congress:** *72nd Annual Meeting of the International Society of Electrochemistry. (2021, Jeju Island, Korea)* **Contribution:** Oral Communication
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- **Authors:** S. Gutiérrez-Tariñon, J. L. Olloqui-Sariego, J. J. Calvente, G. Mínguez-Espallargas, F. Rey, A. Corma, P. Oña-Burgos
Title: *Cobalt Metal-Organic Framework Based on Layered Double Nanosheets for Enhanced Electrocatalytic Water Oxidation in Neutral Media*
Congress: *International Conference of "Electrocatalysis for Renewable Energy (2021, Leiden, Netherlands).* **Contribution:** Poster
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- **Authors:** I. Márquez, J. L. Olloqui-Sariego, M. Molero, R. Andreu, E. Roldán, J. J. Calvente
Title: *Revising the Proton-Coupled Electron Transfer of Immobilized Hemin*
Congress: *71st Annual Meeting of the International Society of Electrochemistry. (2020, Belgrade, Serbia).* **Contribution:** Oral Communication
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- **Authors:** J. L. Olloqui-Sariego, G. S. Zakharova, A. A. Poloznikov, J. J. Calvente, D. M. Hushpalian, L. Gorton, R. Andreu
Title: *Site-directed L157W and F140Y Mutations Accelerate the Direct Electron Transfer of Immobilized Tobacco Peroxidase.*
Congress: *69nd Annual Meeting of the International Society of Electrochemistry. (2018, Bolonia, Italy).* **Contribution:** Oral Communication.
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C.3. Research projects

- **Reference:** PID2021-126799NB-I00
Title: Rationalizing the Factors Underlying the Charge Transfer and Catalysis in Bioelectrodes.
Funding entity: Ministerio de Ciencia e Innovación
Principal investigator: José Luis Olloqui-Sariego (IP1) and Juan José Calvente Pacheco (IP2)

Duration: 01/09/2022 – 31/08/2025. **Amount of funding:** 84.700 €

- **Reference:** TED2021-130191B-C42
Title: Renewable Energy to Chemicals Mediated by H₂O Splitting Coupling with CO₂ Capture and Conversion.
Funding entity: Ministerio de Ciencia e Innovación
Principal investigator: José Luis Olloqui-Sariego (IP1) and Juan José Calvente Pacheco (IP2)
Duration: 01/12/2022 – 30/11/2024. **Amount of funding:** 244.030 €

- **Reference:** PROYEXCEL_00746
Title: Electrofuel Production by Cooperative Means
Funding entity: Junta de Andalucía
Principal investigator: Orestes Rivada Wheelaghan
Duration: 02/12/2022 – 31/12/2025. **Amount of funding:** 143.200 €

- **Reference:** PYC20 RE 060 UAL
Title: Cellulosic Biomass Valorization for the Production of Biomonomers and Hydrogen.
Funding entity: Junta de Andalucía
Principal investigator: Pascual Oña Burgos (University of Almería)
Duration: 27/12/2021 – 31/12/2022. **Amount of funding:** 161.870 €

- **Reference:** P20_01027
Title: Design of Multifunctional Catalysts for the Electrocatalytic Production of H₂ and O₂ Coupled to Biomass Valorization via Magnetic Induction.
Funding entity: Junta de Andalucía
Principal investigator: Pascual Oña Burgos (University of Almería)
Duration: 05/10/2020 – 31/12/2022. **Amount of funding:** 115.650 €

- **Reference:** RED2018-102412-T
Title: Network of Electrochemical Sensors and Biosensors
Funding entity: Ministry of Science, Innovation and Universities
Principal investigator: Encarna Lorenzo Alonso (Autonomous University of Madrid)
Duration: 2020-2021 **Amount of funding:** 20.000 €

- **Reference:** CTQ2015-71955-REDT
Title: Network of Electrochemical Sensors and Biosensors
Funding entity: Ministry of Economy and Competitiveness
Principal investigator: José Manuel Pingarrón Carrazón (Complutense University of Madrid)
Duration: 2016-2017 **Amount of funding:** 40.000 €

- **Reference:** CTQ2014-52641-P
Title: Coupling of Charge Transfer and Molecular Reorganization Processes in Biomimetic Electrochemical Systems
Funding entity: Ministry of Economy and Competitiveness
Principal investigator: Juan José Calvente Pacheco (IP1) and Rafael Andreu Fondacabe (IP2). University of Sevilla
Duration: 01/01/2015 – 31/12/2018. **Amount of funding:** 36.000 €

- **Reference:** CTQ2008-00371
Title: Electrochemistry of Stratified Biomimetic Platforms
Funding entity: Ministry of Science and Innovation
Principal investigator: Juan José Calvente Pacheco (University of Sevilla)
Duration: 01/01/2009 – 31/12/2013. **Amount of funding:** 84.700 €

- **Reference:** CTQ2005-01184
Title: Study of Nanostructured Bioelectrochemical Systems
Funding entity: Ministry of Science and Innovation
Principal investigator: Juan José Calvente Pacheco (University of Sevilla)
Duration: 31/12/2005 – 31/12/2008. **Amount of funding:** 85.680 €