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Research interests

La investigación realizada por nuestro grupo de Electroquímica está orientada al diseño y caracterización de nuevos materiales electródicos, utilizados como sensores electroquímicos en la determinación de moléculas de interés medioambiental, tales como, fenoles, nitritos, nitratos, sulfitos y peróxido de hidrógeno. Dentro del desarrollo de los sensores electroquímicos se contempla como objetivo la aplicación de los sistemas a muestras reales provenientes de la industria, como por ejemplo, la de alimentos. Actualmente, estamos desarrollando estudios para generar electrodos sensores basados en materiales carbonosos, que combinado con el uso de líquidos iónicos, complejos de metales de transición y polímeros conductores, conforman nuevos materiales para desarrollar y validar nuevos métodos analíticos (Electroquímicos) en la detección de contaminantes medioambientales provenientes de distintas fuentes.

Áreas de Investigación: Electroquímica, Polímeros Conductores, Líquidos Iónicos

Research outputs

The case of [(bpm)Re(CO)₃Br] and anti-[Br(CO)₃Re(μ-bpm)Re(CO)₃Br] (bpm: 2,2'-bipyrimidine) towards multi-metallic Re^I species and their properties

Mella, P., Arce, R., Pizarro, N. & Vega, A., 1 Nov 2021, In: Polyhedron. 208, 115436.

Hydrogen evolution reaction highly electrocatalyzed by MWCNT/N-octylpyridinium hexafluorophosphate metal-free system

Gidi, L., Arce, R., Ibarra, J., Isaacs, M., Aguirre, M. J. & Ramírez, G., 10 Mar 2021, In: Electrochimica Acta. 372, 137859.

Study of the hydrogen evolution reaction using ionic liquid/cobalt porphyrin systems as electro and photoelectrocatalysts

Gidi, L., Honores, J., Ibarra, J., Arce, R., Aguirre, M. J. & Ramírez, G., Feb 2020, In: Catalysts. 10, 2, 239.

Enhanced Electrocatalysis of the Oxygen Reduction Reaction Using Cobalt and Iron Porphyrin/Ionic Liquid Systems

Gidi, L., Honores, J., Arce, R., Arévalo, M. C., Aguirre, M. J. & Ramírez, G., 1 Nov 2019, In: Energy Technology. 7, 11, 1900698.

Improved photoelectrocatalytic effect of Co(II) and Fe(III) mixed porphyrins on graphite paste electrodes towards hydrogen evolution reaction

Gidi, L., Honores, J., Ibarra, J., Arce, R., Aguirre, M. J. & Ramírez, G., 28 Aug 2019, In: New Journal of Chemistry. 43, 32, p. 12727-12733 7 p.

Extraction of sulfite for wastewater treatment and for analytical determination

Canales, J. P., Arce, R., Madariaga, C., García, M., Canales, C., Vélez, J., Arévalo, M. C., Aguirre, M. J. & Romero, J., 1 Apr 2019, In: Desalination and Water Treatment. 146, p. 341-350 10 p.

Imidazolium-based ionic liquids as stabilizers for electrode modification with water-soluble porphyrin

García, M., Honores, J., Celis, F., Fuenzalida, F., Arce, R., Aguirre, M. J. & Aracena, A., 1 Jan 2019, In: New Journal of Chemistry. 43, 5, p. 2338-2346 9 p.

Electro-reduction of molecular oxygen mediated by a cobalt(II)octaethylporphyrin system onto oxidized glassy carbon/oxidized graphene substrate

Canales, C., Gidi, L., Arce, R., Armijo, F., Aguirre, M. J. & Ramírez, G., 1 Dec 2018, In: Catalysts. 8, 12, 629.

Effect of the substituent of the cation of N-octylpyridinium hexafluorophosphate in the electrical and electrochemical response of carbon paste electrodes modified with these ionic liquids

Fuenzalida, F., Aravena, D., García, C., García, M., Arce, R., Ramírez, G., Díaz, C., Isaacs, M., Arévalo, M. D. C. & Aguirre, M. J., 20 Dec 2017, In: Electrochimica Acta. 258, p. 959-969 11 p.

Enhanced light-induced hydrogen evolution reaction by supramolecular systems of cobalt(II) and copper(II) octaethylporphyrins on glassy carbon electrodes

Canales, C., Olea, A. F., Gidi, L., Arce, R. & Ramírez, G., 20 Dec 2017, In: Electrochimica Acta. 258, p. 850-857 8 p.

Co₂SnO₄/carbon paste electrode as electrochemical sensor for hydrogen peroxide

Mosquera, N., Aguirre, M. J., Ruiz-León, D., García, C., Arce, R. & Bollo, S., 1 Jun 2017, In: Journal of the Chilean Chemical Society. 62, 2, p. 3525-3528 4 p.

Electrooxidation of sulfite at carbon paste electrode modified with ionic liquids derivated of N-octyl-pyridinium hexafluorophosphate with different substituents in the cation

Fuenzalida, F., García, C., García, M., Arce, R., Báez, C., Aguirre, M. J., Isaacs, M. & Del Carmen Arévalo, M., 1 Jan 2017, In: Journal of the Chilean Chemical Society. 62, 4, p. 3721-3725 5 p.

Electrochemical method for sulfite determination in wines by electrochemical response using a membrane absorber system

Arce, R., Báez, C., Muena, J. P., Aguirre, M. J. & Romero, J., 1 Jan 2016, In: Journal of the Chilean Chemical Society. 61, 4, p. 3206-3209 4 p.

Hydrazine electrooxidation mediated by transition metal octaethylporphyrin-modified electrodes

Canales, C., Gidi, L., Arce, R. & Ramírez, G., 1 Jan 2016, In: New Journal of Chemistry. 40, 3, p. 2806-2813 8 p.

A glassy carbon electrode modified by a copolymer of Co-tetrakis (para-aminophenyl)porphyrin and ortho-phenylenediamine. Characterization and electrocatalytic sulfite oxidation behavior of a basic extract from red wine

Arce, R., Romero, J. & Aguirre, M. J., 1 Dec 2014, In: Journal of Applied Electrochemistry. 44, 12, p. 1361-1369 9 p.

Electrooxidation of free sulfite by an integrated system of glassy carbon modified electrodes with nickel phthalocyanines and membrane absorber in red wine

Arce, R., Aguirre, M. J. & Romero, J., 1 Jan 2014, In: International Journal of Electrochemical Science. 9, 12, p. 7916-7924 9 p.

Sensor for quantitative analytical determination of sulphite in wine using a system of modified electrode and a membrane absorption system

Arce, R., Aguirre, M. J. & Romero, J., 1 Jan 2014, *Chemical and Biological Sensors 11 -and- MEMS/NEMS 11*. Li, J., Kreller, C. R., Simonian, A., Stefan-van Staden, R., Sekhar, P. K., Vanysek, P., Wu, N., Khosla, A., Aguilar, Z. P., Carter, M. T., Hunter, G., Hesketh, P. J., Nagahara, L., Chin, B. & Mitra, S. (eds.). 1 ed. Electrochemical Society Inc., p. 37-42 6 p. (ECS Transactions; vol. 64, no. 1).

Direct 4-electron reduction of molecular oxygen to water mediated by Cu-10-(4-aminophenyl)-5,15-dimesitylcorrole-modified electrodes

Isaacs, F., Dehaen, W., Maes, W., Ngo, T. H., Ruiz-León, D., Herrera, F., Arce, R., Arévalo, M. C. & Aguirre, M. J., 1 Mar 2013, In: International Journal of Electrochemical Science. 8, 3, p. 3406-3418 13 p.

Simple steps for synthesis of silicon oxide Mesoporous materials used as template

Velez, J., Arce, R., Alburquenque, D., Gautier, J. L., Zuñiga, C. & Herrera, F., 1 Jan 2013, In: Journal of the Chilean Chemical Society. 58, 4, p. 1998-2000 3 p.

Sulfite oxidation mediated by ortho-phenylenediamine / co(ii)- tetrakis(para-aminophenyl)porphyrin copolymers in acid medium

Arce, R., Márquez, P., Herrera, F., Aguirre, M. J. & Romero, J., 1 Jan 2013, In: Journal of the Chilean Chemical Society. 58, 4, p. 1982-1985 4 p.

Evidence for the formation of a copolymer by simultaneous electropolymerization of p-tetraaminophenyl porphyrin cobalt (II) and o-phenylenediamine on glassy carbon

Arce, R., del Río, R., Ruiz-León, D., Velez, J., Isaacs, M., del Valle, M. A. & Aguirre, M. J., 20 Dec 2012, In: International Journal of Electrochemical Science. 7, 11, p. 11596-11608 13 p.

Glassy carbon modified electrode: Polymer and supramolecular assembly of Co(II)-[Tetra(O-Aminophenyl) Porphyrin] new material for electrocatalytic assays

Riquelme, M. A., Lucero, M. A., Villagrán, M., Arévalo, M. C., Hernández-Creus, A., Velez, J. H., Aguirre, M. J., Arce, R. & Ramírez, G., 1 Dec 2012, In: International Journal of Electrochemical Science. 7, 10, p. 9738-9747 10 p.

Critical comparison between modified Monier-Williams and electrochemical methods to determine sulfite in aqueous solutions

Montes, C., Vélez, J. H., Ramírez, G., Isaacs, M., Arce, R. & Aguirre, M. J., 21 May 2012, In: The Scientific World Journal. 2012, 168148.

Electrooxidation of chlorophenols at a glassy carbon electrode in a pH 11 buffer

Berríos, C., Arce, R., Rezende, M. C., Ureta-Zañartu, M. S. & Gutiérrez, C., 15 Feb 2008, In: Electrochimica Acta. 53, 6, p. 2768-2775 8 p.