



Oscillatory electro-oxidation of small organic molecules: dynamics, mechanism and efficiency

Eletro-oxidação oscilatória de pequenas moléculas orgânicas: dinâmica, mecanismo e eficiência

H. Varela*

Institute of Chemistry of Sao Carlos (ICSC) of the University of Sao Paulo (USP)
Sao Carlos, SP, Brazil.

Abstract: Oscillations along the electrocatalytic oxidation of small organic molecules are ubiquitous and known for a long-time. The importance of studying such reactions is primarily due to their relevance in energy conversion systems and a considerable development in this field has been reached recently. It is presented in this talk the latest works developed at the Electrochemistry Group (ICSC/USP) regarding the oscillatory electro-oxidation of small organic molecules on platinum, platinum-based, and gold surfaces.[1-7] The results are focused on the dynamics, mechanism and efficiency, including half-cells (poly- and single crystals and modified surfaces), and polymer electrolyte membrane (PEM) reactors, and are discussed in connection with the current literature. Some perspectives and directions for future research are also presented.

References:

- [1] M. V. F. Delmonde, M. A. Nascimento, R. Nagao, D. A. Cantane, F. H. B. Lima, H. Varela, *J. Phys. Chem. C* 118 (2014) 17699-17709
- [2] M. V. F. Delmonde, L. F. Sallum, N. Perini, E. R. Gonzalez, R. Schloegl, H. Varela, *J. Phys. Chem. C* 120 (2016) 22365–22374
- [3] J. A. Nogueira, I. K. P. Arias, T. Vidakovic-Koch, H. Varela, K. Sundmacher, *Electrochim. Acta* 212 (2016) 545-552
- [4] B. A. F. Previdello, P. S. Fernández, G. Tremiliosi-Filho, H. Varela, *Electrocat.* 7 (2016) 276-279
- [5] A. A. Zülke, H. Varela, *Sci. Rep.* 6 (2016) 24553
- [6] F. W. Hartl, A. A. Zülke, B. J. Fonte, H. Varela, *J. Electroanal. Chem.* (2017) in press
- [7] G. C. A. Ferreira, T. W. Napporn, K. B. Kokoh, H. Varela (2017) in preparation

* **main author e-mail:** hamiltonvarela@usp.br