PE1

Spatiotemporal Edge Effects on a Pt Ribbon Electrode in the Electro-Oxidation of Formic Acid
포름산의 전기화학적 산화시 삼차원 가장자리 효과에 관한 연구

J. Lee*,**, T. Noh**, J. Christoph**, M. Eiswirth** and G. Ertl**

*포항산업과학연구원 (RIST) 환경에너지연구센터 수질환경연구팀
**Department of Physical Chemistry, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Faradayweg 4-6, D-14195 Berlin, Germany

Here we report experimental observations of the spatiotemporal edge effects in the electro-oxidation of formic acid (HCOOH) on a Pt ribbon electrode. While the previous study showed spatiotemporal pattern formation on a Pt ring electrode [1, 2], all locations are equivalent by symmetry, recent relevant spatiotemporal data on a ribbon-shaped electrode are presented and compared with theoretical simulations. In a thin ribbon electrode, points at the centre are at a different state than points at the edges, which is expected to lead to a spatially inhomogeneous stationary state of the interfacial potential in bistable and oscillatory systems. Experimental observations clearly prove the theoretical expectation derived from a reaction-migration equation [3].

References

[1] J. Lee, Ph.D. thesis, Freie Universität Berlin, Berlin, 2001.
[2] J. Lee, J. Christoph, P. Strasser, M. Eiswirth, G. Ertl, J. Chem. Phys. 115 (2001)1485.
[3] J. Christoph, Ph.D. thesis, Freie Universität Berlin, Berlin, 1999.