

Abstract Submitted  
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**Study Of The Palladium Hydrogen - Deuterium System** JAN MARWAN, Research and Development, Dr Marwan Chemie, Rudower Chaussee 29, 12489 Berlin, Germany — Electrochemical deposition of metals from hexagonal lyotropic liquid crystalline phases produces metal films with a unique ordered nanostructure in which the cylindrical pores of 1.7 to 3.5 nm running through the film are arranged in hexagonal array<sup>1,2,3</sup>. Nanostructured Pd films were deposited electrochemically from the template mixture of either C<sub>16</sub>EO<sub>8</sub> or Brij56. Electrochemical studies showed that the metal films have a high electroactive surface area with the specific surface area of the order of 91 m<sup>2</sup>/g. These values together with the TEM and X-ray data are consistent with the expected H<sub>1</sub> nanostructure. The hydrogen region of nanostructured Pd in the cyclic voltammetry in 1 M H<sub>2</sub>SO<sub>4</sub> was more resolved than that of plain Pd because of the thin walls of the nanostructure and the high surface area. We could distinguish the hydrogen adsorption and absorption processes. The permeation of hydrogen into the Pd metal lattice occurs with fast kinetics when the Pd surface is blocked by either crystal violet or Pt.

<sup>1</sup>Attard, G. S, et al, Mesoporous Science 1997, 278, (31), 838- 840.

<sup>2</sup>Attard, G. S, et al, Langmuir 1998, 14, 7340- 7342.

<sup>3</sup>Attard, G. S.; Goeltner, C. G.; Corker, J. M.; Henke, S.; Templer, R. H., Angew. Chem. Int. Ed. Engl. 1997, 36, 1315-1317.

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