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Electrochemical and Electron Probe Microanalysis Measurements on Nanostructured Palladium JAN MARWAN, BAM Federal Institute for Research and Testing, Division VI.4 Surface technologies,12200 Berlin, Germany, VANESSA RACKWITZ, Forschung & Entwicklung, Rudower Chaussee 29, D-12489 Berlin, Germany — The hydrogen region of nanostructured Pd in the cyclic voltammetry in 1 M H2SO4 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. We believe that the hydrogen absorption process takes place without passing through the adsorbed state so that hydrogen diffuses directly into the Pd bulk. This process speeds up when the formation of adsorbed hydrogen is suppressed by the coverage of poisons. These results were compared to those obtained in a heavy water solution to which the Pd electrode was exposed. Adsorption characteristics of deuterium on the Pd metal surface are slightly different to those obtained for hydrogen in previous studies. Diffusion of deuterium into the Pd metal lattice works with fast kinetics under appropriate surface modification. We are also interested in studying the Pd structure before and after long term electrolysis in light and heavy water using electron probe micronanalysis (EPMA) with a energy dispersive spectrometer (EDS)

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