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New Technique of Activating Palladium Surface for Absorption of Hydrogen or Deuterium

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Activation is carried out by heating a Pd specimen at about 600 °C for several minutes in air. The activated surface is blue, and it is bleached when immersed in hydrogen gas. The blue film is identified as PdO, and the bleached surface consists of nanocrystallites of metallic Pd, as proved by electron diffraction. An activated Pd plate 0.7 mm in thickness is capable of absorbing, in 1 h, about 70 at% of H or D, the saturation value, in hydrogen gas of 1 atm at room temperature. The atomic ratio of H absorbed in Pd has been estimated to be about 70% when Pd metal is in equilibrium with hydrogen gas of 1 atm at 25°C.¹⁾ Since this value could not easily be attained in ordinary experimental studies, various activation procedures have been proposed.²⁾ The present note proposes a new activation technique which is very simple and more efficient. It is useful also for D, although detailed data for H are given below.

KEYWORDS: palladium, hydrogen, deuterium, absorption, cold fusion, palladium oxide, electron diffraction