

Hydrogen permeation in stressed and strained membranes of palladium alloys

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Abstract

In experimental studies of hydrogen permeation through a Pd₇₇Ag₂₃ membrane at 25 and 50°C, forms of the time-dependent changes of hydrogen pressure within the membrane have been found to be clearly dependent on the catalytic activities of the membrane surface, initial hydrogen content of the membrane and conditions of lattice strain due to different processes of generation of lattice stress. This strongly supports the appreciation that hydrogen diffusion in metals involves non-Fickian features which are associated with Gorsky Effect phenomena. Correlations have been made between these effects and the forms of isothermal hydrogen pressure(p)-hydrogen content(n) relationships for the Pd₇₇Ag₂₃H_n system.