Hydrogen pressure and electrical resistivity dependencies on hydrogen content in the $Pd_{81}Pt_{19}$ H_n system

Kandasamy, K.[a], Lewis, F.A.[b], Sakamoto, Y.[c] and Tong, X.Q.[d]

[a] Department of Physics, University of Jaffna, Jaffna, Sri Lanka
[b] School of Chemistry, Queen's University, Belfast BT9 5AG, United Kingdom
[c] Dept. of Mat. Sci. and Engineering, Nagasaki University, Nagasaki 852, Japan
[d] Department of Materials Science, Tsinghua University, Beijing, China

Abstract

Combinations of knowledge of the hydrogen pressure-hydrogen content-temperature (p-c(n)-T) relationships of the $Pd_{81}Pt_{19}$ H_n system, and of the dependency of hydrogen content, n, in $Pd_{81}Pt_{19}$ on electrical resistivity, have continued to provide interesting research opportunities. For example such information has provided definite arguments concerning interpretations of hydrogen overpotentials measured during electrolytic hydrogen evolution at both catalytically active and inactive cathode surfaces. Latterly, this $Pd_{81}Pt_{19}$ H_n information has also proved invaluable in regard to elastic strain gradient lines of interpretation of `Uphill' hydrogen diffusion processes operative within hydrogen permeation membranes.

Indexed keywords

Engineering controlled terms: Catalysis; Cathodes; Diffusion in solids; Electric conductivity of solids; Electrolysis; Gas permeable membranes; Palladium alloys; Strain

Engineering uncontrolled terms: Electrolytic hydrogen evolution

Engineering main heading: Hydrogen fuels