Lattice strain gradient effects on hydrogen diffusion parameter calculations

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

[a] School of Chemistry, Queen's University, David Keir Building, Belfast, BT9 5AG, United Kingdom
[b] Physics Department, University of Jaffna, Jaffna, Sri Lanka
[c] Department of Material Sciences, Tsinghua University, Beijing, China

Abstract

With reference to proposals initially formulated by Gorsky (Phys. Z. Sowjetunion 8 (1935) 457), experimental evidence and theoretical arguments relating to stress/strain gradients resulting from migrations of hydrogen interstitials have been considered in studies with palladium and palladium alloys. In particular, Gorsky effect explanations have been proposed in interpretations of 'uphill diffusion effect' phenomena that have become substantially evidenced over the courses of studies of hydrogen diffusion behaviour.

Author keywords

Gorsky effect; Stress/strain gradients; Uphill diffusion

Indexed keywords

Engineering controlled terms: Diffusion in gases; Elasticity; Palladium alloys; Strain; Stress analysis

Engineering uncontrolled terms: Gorsky effect

Engineering main heading: Hydrogen