

Strain gradient influences on apparent dependences of hydrogen diffusion coefficients on hydrogen content in the $\text{Pd}_{81}\text{Pt}_{19}\text{H}_n$ system

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Abstract

Consolidating studies are reported of 'uphill hydrogen diffusion' effects produced by lattice strain gradients during hydrogen permeation through tubular membranes of a $\text{Pt}_{81}\text{Pt}_{19}$ alloy at 25 degrees C. Hydrogen permeation has been initiated by outer surface introductions and removals of hydrogen both from and into the gas phase and also by means of electrolysis. Results demonstrate further effects of strain gradients in producing misleading trends of dependence of hydrogen diffusion coefficients on hydrogen content.