

Situational observation of hydrogen diffusing in metals

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Hydrogen Embrittlement has been known for a long time as a phenomenon. However, this generating mechanism and this generation mechanism have not been necessarily clarified though are advocated many ideas such as hydrogen-enhanced strain-induced vacancy model and lattice decohesion theory. Then, we have developed the experimental apparatus to catch the early phenomenon of hydrogen embrittlement. The measurements technique is the vibrating reed method. In this method, resonance frequency (\propto Young's modulus) and Q-value can be measured. For the sensitivity test, annealed SUS304 samples were prepared and measured of temperature dependence of resonance frequency and calculated the diffusion constants of hydrogen. This result is same as N.J,Simon, et al.¹ The results of these experiments, it has been understood to be able to detect the existence and the quantity of hydrogen used by our apparatus.

¹Edited by N.J.Simon, et al.; Structural Materials for Superconducting Magnets I.AISI 316 stainless steel, National Bureau of Standards, USA (1982).