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The wake of H in V, Nb and Ta at elevated temperatures: Irreversibility and non-central forces revisited FRANZ REIDINGER — At elevated temperatures U and Do of the Arrhenius equation for diffusion describe the amplitude and relaxation rate, respectively, of the stern wave wake of H in V, Nb and Ta. The key evidence for this hypothesis is the close correlation between the isotope dependence of U derived from the Gorsky measurements[1] and the shear distortion of the orthorhombic phases of NbH(D) and TaH(D). The isotope dependence of U can be expressed in closed form: U=a$\sqrt{M}$ + b$\sqrt{m}$ where M and m are the atomic numbers of the host metal and H isotope and a and b are 7.4 and 37 for Nb and Ta, and 0 and 55 for V, respectively, in units of meV. I explain this correlation in two steps: a) the cubic symmetry of the nearest neighbor strain field[2] of the interstitial H is the result of a dynamic superposition, possibly caused by a JT resonance[3], of the two orthorhombic variants of β-NbH0.75 and b) the successful characterization of the diffusion process as jump diffusion[4] eliminates the transition state from consideration. Instead it is the relaxation of the just emptied site from its residual orthorhombic distortion towards the cubic symmetry of the bcc metal which is being measured. 1)Z Qi, J Voelkl, R Laesser and H Wenzl: J. Phys. F 13, 2053 (1983) 2)G Bauer, E Seitz, W Schmatz and H Horner: Sol. State Comm. 17, 161 (1975) 3)G C Abell: J. Phys. F 12, 1143 (1982) 4) V Lottner, A Heim and T Springer: Z. Physik B 32, 157 (1979).

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