Graphics page

Thermal transpiration: Beyond Takaishi and Sensui

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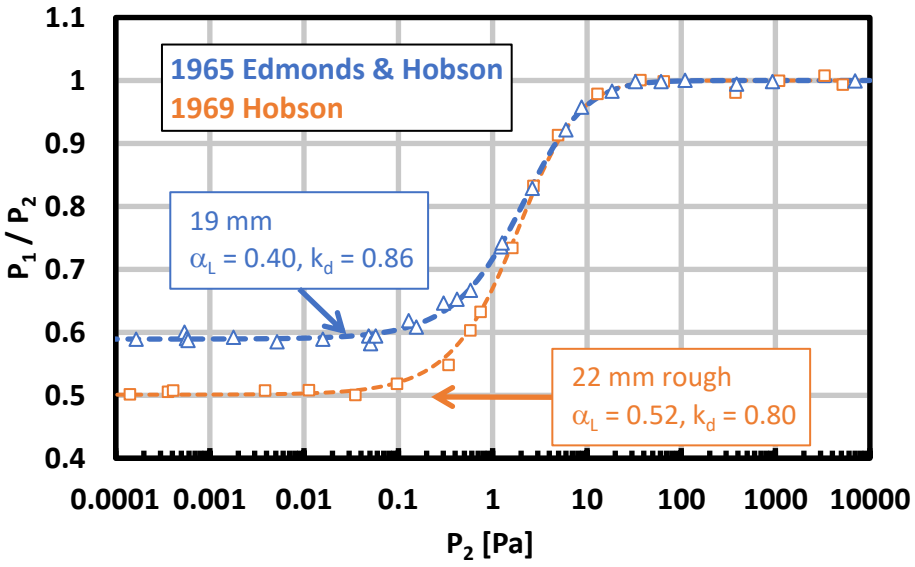

Figure 1. Edmonds and Hobson measured the thermomolecular effect in a 19 mm diameter pyrex tube with smooth walls. Hobson later repeated the measurement in a tube of similar diameter but with a rough surface, and he found agreement at low pressure with the value expected for complete accommodation: $(P_1 / P_2) = (T_1 / T_2)^{1/2}$ (77 K / 295 K)$^{1/2}$ = 0.51. The curves are the dusty-gas model with the indicated values of the accommodation parameter α_L and the diameter parameter k_d. For perfect accommodation the accommodation parameter is α_L = 1/2.

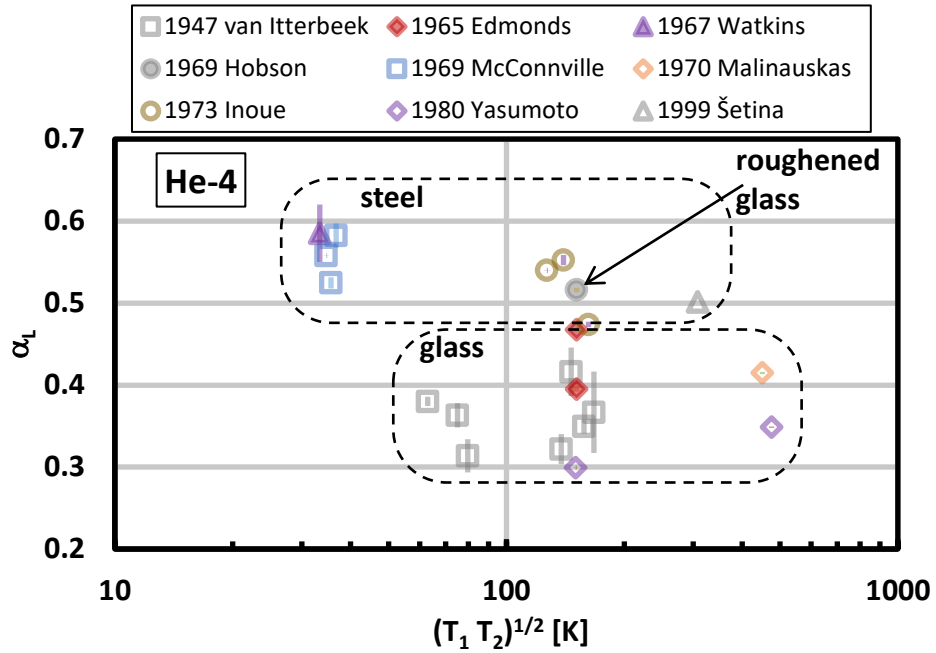

Figure 2. Glass tubes typically have α_L < 1/2, which implies imperfect accommodation, while steel tubes typically have α_L > 1/2, which implies back scattering from a rough surface.