

66. We use the result of exercise 58 to set up the ratio

$$\frac{v_1}{v_2} = \frac{\sqrt{\gamma_1 RT/M_1}}{\sqrt{\gamma_2 RT/M_2}} = \sqrt{\frac{M_2}{M_1}} \quad \text{if } \gamma_1 = \gamma_2 .$$

That final condition (equality of the γ 's) is reasonable if we are comparing diatomic gas to diatomic gas, or monatomic gas to monatomic gas. That is, all diatomic gases have $\gamma = 1.4$ (or very nearly so), and all monatomic gases have $\gamma \approx 1.7$.