

47. From the data given in the problem, we calculate frequencies (using Eq. 39-1), take their square roots, look up the atomic numbers (see Appendix F), and do a least-squares fit to find the slope: the result is 5.02×10^7 with the odd-sounding unit of a square root of a Hertz. We remark that the least squares procedure also returns a value for the y -intercept of this statistically determined “best-fit” line; that result is negative and would appear on a graph like Fig. 41-17 to be at about -0.06 on the vertical axis. Also, we can estimate the slope of the Moseley line shown in Fig. 41-17:

$$\frac{(1.95 - 0.50)10^9 \text{ Hz}^{1/2}}{40 - 11} \approx 5.0 \times 10^7 \text{ Hz}^{1/2} .$$

These are in agreement with the discussion in §41-10.