

83. We note that every Calcium-40 atom and Krypton-40 atom found now in the sample was once one of the original number of Potassium atoms. Thus, using Eq. 43-13 and Eq. 43-17, we find

$$\begin{aligned}\ln\left(\frac{N_{\text{K}}}{N_{\text{K}} + N_{\text{Ar}} + N_{\text{Ca}}}\right) &= -\lambda t \\ \ln\left(\frac{1}{1 + 1 + 8.54}\right) &= -\frac{\ln 2}{T_{1/2}} t\end{aligned}$$

which (with $T_{1/2} = 1.26 \times 10^9$ y) yields $t = 4.3 \times 10^9$ y.