

42. Combining Eqs. 43-19 and 43-20, we obtain

$$M_{\text{sam}} = N \frac{M_{\text{K}}}{N_{\text{A}}} = \left( \frac{RT_{1/2}}{\ln 2} \right) \left( \frac{40 \text{ g/mol}}{6.02 \times 10^{23} / \text{mol}} \right)$$

which gives 0.66 g for the mass of the sample once we plug in  $1.7 \times 10^5/\text{s}$  for the decay rate and  $1.28 \times 10^9 \text{ y} = 4.04 \times 10^{16} \text{ s}$  for the half-life.