

Dimensional Analysis Hand-in Answer Key

1. How many atoms are in 55.2g Li?

$$55.2 \text{g Li} \left(\frac{1 \text{ mol Li}}{6.94 \text{g Li}} \right) \left(\frac{6.02 \times 10^{23} \text{ atoms Li}}{1 \text{ mol Li}} \right) \\ = 4.79 \times 10^{24} \text{ atoms Li}$$

2. What is the mass of 6.02×10^{24} atoms Bi?

$$6.02 \times 10^{24} \text{ atoms Bi} \left(\frac{1 \text{ mol Bi}}{6.02 \times 10^{23} \text{ atoms Bi}} \right) \left(\frac{208.98 \text{g Bi}}{1 \text{ mol Bi}} \right) \\ = 2089.8 \text{g Bi} \rightarrow 2090 \text{g Bi}$$

3. How many molecules are in 0.000349g of calcium iodide?

$$0.000349 \text{g CaI}_2 \left(\frac{1 \text{ mol CaI}_2}{293.88 \text{g CaI}_2} \right) \left(\frac{6.02 \times 10^{23} \text{ molecules CaI}_2}{1 \text{ mol CaI}_2} \right) \\ = 7.15 \times 10^{17} \text{ molecules CaI}_2$$

4. What is the mass of 3.34×10^{22} molecules H_2O ?

$$3.34 \times 10^{22} \text{ molecules H}_2\text{O} \left(\frac{1 \text{ mol H}_2\text{O}}{6.02 \times 10^{23} \text{ molecules H}_2\text{O}} \right) \left(\frac{18.02 \text{g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} \right) \\ = 0.99978 \text{g H}_2\text{O} \rightarrow 1.00 \text{g H}_2\text{O}$$

5. How many sodium chloride atoms in 117g NaCl?

$$117 \text{g NaCl} \left(\frac{1 \text{ mol NaCl}}{58.44 \text{g NaCl}} \right) \left(\frac{6.02 \times 10^{23} \text{ atoms NaCl}}{1 \text{ mol NaCl}} \right) \\ = 1.21 \times 10^{24} \text{ atoms NaCl}$$