

Discussion Quiz #2 10 minutes
KEY

1. (2 points) For the following circle the one with the lightest mass?

a) $3 \text{ mol I}_2 \frac{(1126.9 \text{ g}) \cdot 2}{1 \text{ mol I}_2} =$

b) Amount of potassium containing 5×10^{50}

$$5 \times 10^{50} \text{ electrons} \frac{1 \text{ Katom}}{19 e^-} \frac{1 \text{ mol K}}{6.002 \cdot 10^{23} \text{ atoms}} \frac{39.1 \text{ g}}{1 \text{ mol K}} =$$

c) $6 \times 10^{15} \text{ u of Ba}$ $\frac{1}{6.022 \cdot 10^{23} \text{ g}} = \frac{6 \cdot 10^{15}}{6.022 \cdot 10^{23} \text{ g}} =$

2. (3 points) How many moles of hydrated ions are formed when 0.1 mol of calcium carbonate completely dissolves in water?

1 mol of CaCO_3 : 1 mol of Ca^{2+} and 1 mol of CO_3^{2-}

$$0.1 \text{ mol CaCO}_3 \frac{2 \text{ mol Ions}}{1 \text{ mol CaCO}_3} = 0.2 \text{ mol}$$

ions = 0.2 mol

3. A protein molecule has mass 12,000 u.

a. (2 points) Calculate the molar mass of the protein. Express your answer to the correct number of significant figures.

Molar mass = 12,000 g/mol

$$12,000 \text{ u} \cdot \frac{1}{6.022 \cdot 10^{23} \text{ g}} = \frac{12000}{6.022 \cdot 10^{23}} \text{ g} \cdot \frac{N_A}{\text{mol}} = \frac{12000}{6.022 \cdot 10^{23}} \text{ g} \cdot \frac{6.022 \cdot 10^{23}}{\text{mol}} = 12000 \frac{\text{g}}{\text{mol}}$$

b. (3 points) Calculate the mass of the single protein. Express your answer to the correct number of significant figures.

mass = $2.0 \times 10^{-20} \text{ g}$

$$12,000 \text{ u} \cdot \frac{1}{6.022 \cdot 10^{23} \text{ g}} = 2.0 \cdot 10^{-20} \text{ g}$$