Review: Molecular Mass and Mole Conversions Quiz

1) Calculate the molecular mass of $Ca_3(PO_4)_2$.

$Ca = 3 \times 40.08 = 120.24$

$P = 2 \times 30.97 = 61.94$

$O = 8 \times 16.00 = 128.00$

310.18 g

2) Find the number of molecules in 0.678 mole of CO_2 molecules. Factor label.

$$\frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol } CO_2} \left| \frac{0.678 \text{ mol } CO_2}{} \right. = \boxed{4.08 \times 10^{23} \text{ molecules } CO_2}$$

3) Calculate the mass in grams of 0.25 mole of $AlCl_3$.

$$\frac{133.33 \text{ g } AlCl_3}{1 \text{ mol } AlCl_3} \left| \frac{0.25 \text{ mol } AlCl_3}{} \right. = \boxed{33 \text{ g } AlCl_3}$$

4) Use factor labeling to convert 3.98×10^{29} atoms Ag to moles.

$$\frac{1 \text{ mol Ag}}{6.02 \times 10^{23} \text{ atoms Ag}} \left| \frac{3.98 \times 10^{29} \text{ atoms}}{} \right. = \boxed{661{,}000 \text{ mol Ag}}$$

5) Use factor labeling to convert 8.88×10^{31} molecules NH_4 to moles.

$$\frac{1 \text{ mol } NH_4}{6.02 \times 10^{23} \text{ molecules } NH_4} \left| \frac{8.88 \times 10^{31} \text{ molecules } NH_4}{} \right. = \boxed{1.48 \times 10^{8} \text{ mol } NH_4}$$

6) How many grams of Potassium are there if you have 4.21×10^{24} atoms of Potassium?

$$\frac{39.10 \text{ g K}}{1 \text{ mol K}} \left| \frac{1 \text{ mol K}}{6.02 \times 10^{23} \text{ atoms K}} \right| \frac{4.21 \times 10^{24} \text{ atoms K}}{} = \boxed{273 \text{ g K}}$$

Review: Molecular Mass and Mole Conversions Quiz (Version 2)

1) Calculate the molecular mass of $Ba_3(AsO_4)_2$.

Ba: $3 \times 137.33 = 411.99$ g
As: $2 \times 74.92 = 149.84$ g
O: $8 \times 16.00 = 128.00$ g

689.83 g

2) Find the number of molecules in 0.831 mole of NH_3 molecules. Factor label.

$$\frac{6.02 \times 10^{23} \text{ molecules } NH_3}{1 \text{ mol } NH_3} \left| \frac{0.831 \text{ mol } NH_3}{} \right. = 5.00 \times 10^{23} \text{ molecules } NH_3$$

3) Calculate the mass in grams of 0.37 mole of BBr_3.

$$\frac{250.51 \text{ g } BBr_3}{1 \text{ mol } BBr_3} \left| \frac{0.37 \text{ mol } BBr_3}{} \right. = 93 \text{ g } BBr_3$$

4) Use factor labeling to convert 5.63×10^{26} atoms Hg to moles.

$$\frac{1 \text{ mol Hg}}{6.02 \times 10^{23} \text{ atoms Hg}} \left| \frac{5.63 \times 10^{26} \text{ atoms Hg}}{} \right. = 935 \text{ mol Hg}$$

5) Use factor labeling to convert 9.53×10^{37} molecules SO_3 to moles.

$$\frac{1 \text{ mol } SO_3}{6.02 \times 10^{23} \text{ molecules } SO_3} \left| \frac{9.53 \times 10^{37} \text{ molecules } SO_3}{} \right. = 1.58 \times 10^{14} \text{ mol } SO_3$$

6) How many grams of Titanium are there if you have 7.39×10^{28} atoms of Titanium?

$$\frac{47.88 \text{ g Ti}}{1 \text{ mol Ti}} \left| \frac{1 \text{ mol Ti}}{6.02 \times 10^{23} \text{ atoms Ti}} \right| \frac{7.39 \times 10^{28} \text{ atoms Ti}}{} = 5,880,000 \text{ g Ti}$$