

# Mole Money, Mole Problems

Name Keef

Block \_\_\_\_\_ Date \_\_\_\_\_

Perform the following conversions. Show all of your work, mind sig figs, and include your units to receive full credit.

- 1) Determine how many moles of aluminum nitrate are in 17.5g.

$$17.5 \text{ g} \left( \frac{1 \text{ mol}}{212.996 \text{ g}} \right) = 0.0822 \text{ mol Al(NO}_3)_3$$

- 2) How many molecules of chlorine gas are in 0.354 mol?

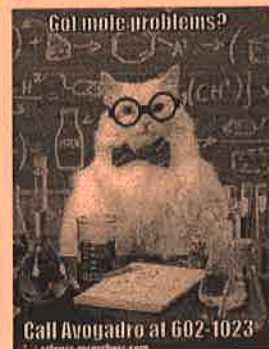
$$0.354 \text{ mol} \left( \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol}} \right) = 2.13 \times 10^{23} \text{ molecules}$$

- 3) How many moles of calcium sulfate do  $1.22 \times 10^{24}$  molecules represent?

$$1.22 \times 10^{24} \text{ molecules} \left( \frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ molecules}} \right) = 2.03 \text{ mol}$$

- 4) How many grams does 2.23 mol of ammonium phosphate weigh?

$$2.23 \text{ mol} \left( \frac{149.09 \text{ g}}{1 \text{ mol}} \right) = 332 \text{ g}$$



5) How many grams does  $1.45 \times 10^{23}$  molecules of water weigh?  $\text{H}_2\text{O}$

$$1.45 \times 10^{23} \text{ molecules} \left( \frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ molecules}} \right) \left( \frac{18.02 \text{ g}}{1 \text{ mol}} \right) = \boxed{4.34 \text{ g}}$$

6) How many molecules of iron (II) bromide are present in a 3.29g sample?  $\text{FeBr}_2$

$$3.29 \text{ g} \left( \frac{1 \text{ mol}}{215.65 \text{ g}} \right) \left( \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol}} \right) = \boxed{9.18 \times 10^{21} \text{ molecules}}$$

7) How many acetate ions are present in 14.3 g of cobalt (III) acetate?  $\text{Co}(\text{C}_2\text{H}_3\text{O}_2)_3$

$$14.3 \text{ g} \left( \frac{1 \text{ mol}}{236.06 \text{ g}} \right) \left( \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol}} \right) \left( \frac{3 \text{ acetate}}{1 \text{ molecule}} \right) = \boxed{1.09 \times 10^{23} \text{ acetate ions}}$$

8) If  $8.03 \times 10^{24}$  oxygen atoms are present in a sample of sodium carbonate, how much does the sample weigh in grams?  $\text{Na}_2\text{CO}_3$

$$8.03 \times 10^{24} \text{ oxygen atoms} \left( \frac{1 \text{ molecule}}{3 \text{ oxygen}} \right) \left( \frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ molecules}} \right) \left( \frac{105.97 \text{ g}}{1 \text{ mol}} \right) = \boxed{471 \text{ g}}$$