

CHM 110 Practice Set 4
Basic Chemical Calculations

SOLUTIONS

Basic mass/mole calculations: Solve each problem. Show your work, and write your final answer for each in the provided blank.

1) What is the mass in grams of 0.750 moles of metallic aluminum?

20.2 g aluminum Al: 26.98 g Al = mol Al

$$0.750 \text{ mol Al} \times \frac{26.98 \text{ g Al}}{\text{mol Al}} =$$

2) What is the mass in grams of 3.14 moles of potassium carbonate?

434 g potassium carbonate K_2CO_3 : 138.21 g K_2CO_3 = mol K_2CO_3

$$3.14 \text{ mol K}_2\text{CO}_3 \times \frac{138.21 \text{ g K}_2\text{CO}_3}{\text{mol K}_2\text{CO}_3} =$$

3) Calculate the moles of chromium in a 75.0 gram sample of chromium metal.

1.44 mol chromium Cr: 52.00 g Cr = mol Cr

$$75.0 \text{ g Cr} \times \frac{\text{mol Cr}}{52.00 \text{ g Cr}} =$$

4) Calculate the moles of $\text{Ca}(\text{NO}_3)_2$ in a 250. gram sample of calcium nitrate

1.52 mol calcium nitrate $\text{Ca}(\text{NO}_3)_2: 164.10 \text{ g } \text{Ca}(\text{NO}_3)_2 = \text{mol } \text{Ca}(\text{NO}_3)_2$

$$250. \text{ g } \text{Ca}(\text{NO}_3)_2 \times \frac{\text{mol } \text{Ca}(\text{NO}_3)_2}{164.10 \text{ g } \text{Ca}(\text{NO}_3)_2} =$$

5) Calculate the mass percent of *nitrogen* in calcium nitrate, $\text{Ca}(\text{NO}_3)_2$.

17.07 % N

Ca: 1×40.08

N: $2 \times 14.01 = 28.02$

O: 3×16.00

164.10 g $\text{Ca}(\text{NO}_3)_2 = \text{mol } \text{Ca}(\text{NO}_3)_2$

$$\frac{28.02}{164.10} \times 100 \% = 17.07 \% \text{ N}$$