

**Review practice problems (answers to be posted Thursday):**

1. How many molecules of carbon dioxide are present in 15 litres of gas at STP?

$$\frac{15 \text{ L CO}_2}{1} \times \frac{1 \text{ mol CO}_2}{22.4 \text{ L CO}_2} \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol CO}_2} = 4.03 \times 10^{23} \text{ molecules of CO}_2$$

2. How many atoms of hydrogen are present in 15 g of NH<sub>3</sub>?

$$\frac{15 \text{ g NH}_3}{1} \times \frac{1 \text{ mol NH}_3}{17 \text{ g NH}_3} \times \frac{6.02 \times 10^{23} \text{ molecules NH}_3}{1 \text{ mol NH}_3} \times \frac{3 \text{ atoms H}}{1 \text{ molecule NH}_3} = 1.6 \times 10^{24} \text{ atoms of H}$$

3. If you have 13 moles of NaCl and want to use all of it to prepare a 0.25 M solution, how much water do you need as your solvent?

$$13 \text{ mol NaCl} / 0.25 \text{ M NaCl} = 52 \text{ L}$$

4. What is the concentration of a solution that has 50g of CuSO<sub>4</sub> dissolved in 250 ml of water?

$$\frac{50 \text{ g CuSO}_4}{1} \times \frac{1 \text{ mol CuSO}_4}{159.5 \text{ g CuSO}_4} = 0.313 \text{ mol CuSO}_4 \quad 0.313 \text{ mol CuSO}_4 / 0.250 \text{ L} = [1.25] \text{ CuSO}_4$$

5. How many grams of Iodine are required to prepare a 500 ml, 0.2 molar solution?

$$0.5 \text{ L} \times 0.2 \text{ M} = 0.1 \text{ mol Iodine} \quad \frac{0.1 \text{ mol I}}{1} \times \frac{130 \text{ g I}}{1 \text{ mol I}} = 13 \text{ g I}$$