

## Moles, Molecules, and Grams Worksheet

Key

- 1) How many molecules are there in 24 grams of  $\text{FeF}_3$ ?

$$\frac{24 \text{ g FeF}_3}{112.81 \text{ g FeF}_3} \times \frac{1 \text{ mol FeF}_3}{1 \text{ mol FeF}_3} \times 6.02 \times 10^{23} \text{ molec FeF}_3 = 1.28 \times 10^{23} \text{ molec FeF}_3$$

- 2) How many molecules are there in 450 grams of  $\text{Na}_2\text{SO}_4$ ?

$$\frac{450 \text{ g Na}_2\text{SO}_4}{142.07 \text{ g Na}_2\text{SO}_4} \times \frac{1 \text{ mol Na}_2\text{SO}_4}{1 \text{ mol Na}_2\text{SO}_4} \times 6.02 \times 10^{23} \text{ molec Na}_2\text{SO}_4 = 1.91 \times 10^{24} \text{ molec Na}_2\text{SO}_4$$

- 3) How many grams are there in  $2.3 \times 10^{24}$  atoms of silver?

$$\frac{2.3 \times 10^{24} \text{ atoms Ag}}{6.02 \times 10^{23} \text{ atoms Ag}} \times \frac{1 \text{ mol Ag}}{1 \text{ mol Ag}} \times 107.87 \text{ g Ag} = 412.13 \text{ g Ag}$$

- 4) How many grams are there in  $7.4 \times 10^{23}$  molecules of  $\text{AgNO}_3$ ?

$$\frac{7.4 \times 10^{23} \text{ molec AgNO}_3}{6.02 \times 10^{23} \text{ molec AgNO}_3} \times \frac{1 \text{ mol AgNO}_3}{1 \text{ mol AgNO}_3} \times 169.84 \text{ g AgNO}_3 = 208.77 \text{ g AgNO}_3$$

- 5) How many grams are there in  $7.5 \times 10^{23}$  molecules of  $\text{H}_2\text{SO}_4$ ?

$$\frac{7.5 \times 10^{23} \text{ molec H}_2\text{SO}_4}{6.02 \times 10^{23} \text{ molec H}_2\text{SO}_4} \times \frac{1 \text{ mol H}_2\text{SO}_4}{1 \text{ mol H}_2\text{SO}_4} \times 98.02 \text{ g H}_2\text{SO}_4 = 122.12 \text{ g H}_2\text{SO}_4$$

- 6) How many molecules are there in 122 grams of  $\text{Cu}(\text{NO}_3)_2$ ?

$$\frac{122 \text{ g Cu}(\text{NO}_3)_2}{187.48 \text{ g Cu}(\text{NO}_3)_2} \times \frac{1 \text{ mol Cu}(\text{NO}_3)_2}{1 \text{ mol Cu}(\text{NO}_3)_2} \times 6.02 \times 10^{23} \text{ molec Cu}(\text{NO}_3)_2 = 3.92 \times 10^{23} \text{ molec Cu}(\text{NO}_3)_2$$

- 7) How many grams are there in  $9.4 \times 10^{25}$  molecules of  $\text{H}_2$ ?

$$\frac{9.4 \times 10^{25} \text{ molec H}_2}{6.02 \times 10^{23} \text{ molec H}_2} \times \frac{1 \text{ mol H}_2}{1 \text{ mol H}_2} \times 2 \text{ g H}_2 = 3212 \text{ g H}_2$$

- 8) How many molecules are there in 230 grams of  $\text{CoCl}_2$ ?

$$\frac{230 \text{ g CoCl}_2}{129.83 \text{ g CoCl}_2} \times \frac{1 \text{ mol CoCl}_2}{1 \text{ mol CoCl}_2} \times 6.02 \times 10^{23} \text{ molec CoCl}_2 = 1.07 \times 10^{24} \text{ molec CoCl}_2$$

- 9) How many molecules are there in 2.3 grams of  $\text{NH}_4\text{SO}_2$ ?

$$\frac{2.3 \text{ g NH}_4\text{SO}_2}{82.04 \text{ g NH}_4\text{SO}_2} \times \frac{1 \text{ mol NH}_4\text{SO}_2}{1 \text{ mol NH}_4\text{SO}_2} \times 6.02 \times 10^{23} \text{ molec NH}_4\text{SO}_2 = 1.69 \times 10^{22} \text{ molec NH}_4\text{SO}_2$$

- 10) How many grams are there in  $3.3 \times 10^{23}$  molecules of  $\text{N}_2\text{I}_6$ ?

$$\frac{3.3 \times 10^{23} \text{ molec N}_2\text{I}_6}{6.02 \times 10^{23} \text{ molec N}_2\text{I}_6} \times \frac{1 \text{ mol N}_2\text{I}_6}{1 \text{ mol N}_2\text{I}_6} \times 789.4 \text{ g N}_2\text{I}_6 = 432.73 \text{ g N}_2\text{I}_6$$