**Learning Target 5.2 I can convert between moles, molecules and mass (g) for a given element or compound.**

1. How many molecules are there in 24 grams of $FeF_3$?

$$24\text{ g } FeF_3 \left| \frac{1\text{ mol } FeF_3}{112.8\text{ g } FeF_3} \right| \frac{6.02\times10^{23}\text{ molecules } FeF_3}{1\text{ mol } FeF_3} = \frac{24(6.02\times10^{23})}{112.8} = 1.28\times10^{23}\text{ molecules}$$

2. How many molecules are there in 450 grams of $NaSO_4$?

$$450\text{ g } NaSO_4 \left| \frac{1\text{ mol } NaSO_4}{119\text{ g } NaSO_4} \right| \frac{6.02\times10^{23}\text{ molecules}}{1\text{ mol } NaSO_4} = 1.91\times10^{24}\text{ molecules}$$

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

$$2.3\times10^{24}\text{ atom Ag} \left| \frac{1\text{ mol Ag}}{6.02\times10^{23}\text{ atom Ag}} \right| \frac{107.8\text{ g Ag}}{1\text{ mol Ag}} = 421\text{ grams}$$

4. How many grams are there in $7.4 \times 10^{23}$ molecules of $AgNO_3$?

$$7.4\times10^{23}\text{ molecules} \left| \frac{1\text{ mol}}{6.02\times10^{23}\text{ molecules}} \right| \frac{169.8\text{ g } AgNO_3}{1\text{ mol } AgNO_3} = 209\text{ g}$$

5. How many grams are there in $7.5 \times 10^{23}$ molecules of $H_2SO_4$?

$$7.5\times10^{23}\text{ molecules} \left| \frac{1\text{ mol } H_2SO_4}{6.02\times10^{23}\text{ molecules}} \right| \frac{90\text{ g } H_2SO_4}{1\text{ mol } H_2SO_4} = 122\text{ g } H_2SO_4$$

6. Convert 7.680 moles PtSe to grams.

$$7.680\text{ mol PtSe} \left| \frac{274\text{ g PtSe}}{1\text{ mol PtSe}} \right. = 2104.32\text{ g PtSe}$$

7. Convert 0.400 moles of $BF_3$ to molecules.

$$0.400\text{ mol } BF_3 \left| \frac{6.02\times10^{23}\text{ molecules}}{1\text{ mol } BP_3} \right. = 2.4\times10^{23}\text{ molecules}$$

8. Convert 43.0 grams of $SiH_4$ to moles.

$$43.0\text{ g } SiH_4 \left| \frac{1\text{ mol } SiH_4}{32.1\text{ g } SiH_4} \right| \frac{6.02\times10^{23}\text{ molecules } SiH_4}{1\text{ mol } SiH_4} = 8.06\times10^{23}\text{ molecules } SiH_4$$