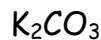


Part 1: Molar Mass

Use the periodic table to find the molar masses of the following.



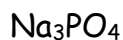
$$1.0 \text{ g/mol} + 35.5 \text{ g/mol} = 36.5 \text{ g/mol}$$



$$2(39.1 \text{ g/mol}) + 12.0 \text{ g/mol} + 3(16.0 \text{ g/mol}) = 138.2 \text{ g/mol}$$



$$40.1 \text{ g/mol} + 2(16.0 \text{ g/mol}) + 2(1.0 \text{ g/mol}) = 74.1 \text{ g/mol}$$



$$3(23.0 \text{ g/mol}) + 31.0 \text{ g/mol} + 4(16.0 \text{ g/mol}) = 164.0 \text{ g/mol}$$

Part 2: Mole Conversions

Work each of the following problems. SHOW ALL WORK.

1. How many atoms are in 6.2 moles of aluminum?

$$? \text{ atoms Al} = 6.2 \text{ mol Al} \times \frac{6.02 \times 10^{23} \text{ atoms Al}}{1 \text{ mol Al}} = 3.7 \times 10^{24} \text{ atoms Al}$$

2. Convert
- 5.3×10^{25}
- molecules of
- CO_2
- to moles.

$$? \text{ moles } CO_2 = 5.3 \times 10^{25} \text{ molecules } CO_2 \times \frac{1 \text{ mole } CO_2}{6.02 \times 10^{23} \text{ molecules } CO_2} = 88 \text{ mol } CO_2$$

3. How many formula units of sodium acetate are in 0.87 moles of sodium acetate?

$$? \text{ f.u. } NaC_2H_3O_2 = 0.87 \text{ mol } NaC_2H_3O_2 \times \frac{6.02 \times 10^{23} \text{ f.u. } NaC_2H_3O_2}{1 \text{ mol } NaC_2H_3O_2} = 5.2 \times 10^{23} \text{ f.u. } NaC_2H_3O_2$$

4. Convert 3.55 moles NaCl to formula units.

$$? \text{ f.u. } NaCl = 3.55 \text{ mol } NaCl \times \frac{6.02 \times 10^{23} \text{ f.u. } NaCl}{1 \text{ mol } NaCl} = 2.14 \times 10^{24} \text{ f.u. } NaCl$$

5. Convert 3.00 moles As_2S_3 to grams.

$$? \text{ g } \text{As}_2\text{S}_3 = 3.00 \text{ mol } \text{As}_2\text{S}_3 \times \frac{246.1 \text{ g } \text{As}_2\text{S}_3}{1 \text{ mol } \text{As}_2\text{S}_3} = 738 \text{ g } \text{As}_2\text{S}_3$$

6. How many moles are represented by 11.5 g of $\text{C}_2\text{H}_5\text{OH}$?

$$? \text{ mol } \text{C}_2\text{H}_5\text{OH} = 11.5 \text{ g } \text{C}_2\text{H}_5\text{OH} \times \frac{1 \text{ mol } \text{C}_2\text{H}_5\text{OH}}{46.0 \text{ g } \text{C}_2\text{H}_5\text{OH}} = 0.250 \text{ mol } \text{C}_2\text{H}_5\text{OH}$$

7. What is the mass of 9.30 moles of SiH_4 ?

$$? \text{ g } \text{SiH}_4 = 9.30 \text{ mol } \text{SiH}_4 \times \frac{32.1 \text{ g } \text{SiH}_4}{1 \text{ mol } \text{SiH}_4} = 299 \text{ g } \text{SiH}_4$$

8. Convert 8.00×10^{20} molecules of H_2 to moles.

$$? \text{ mol } \text{H}_2 = 8.00 \times 10^{20} \text{ molecules } \text{H}_2 \times \frac{1 \text{ mol } \text{H}_2}{6.02 \times 10^{23} \text{ molecules } \text{H}_2} = 1.33 \times 10^{-3} \text{ mol } \text{H}_2$$

9. How many atoms of tin are found in 3.50 moles of tin?

$$? \text{ atoms } \text{Sn} = 3.50 \text{ mol } \text{Sn} \times \frac{6.02 \times 10^{23} \text{ atoms } \text{Sn}}{1 \text{ mol } \text{Sn}} = 2.11 \times 10^{24} \text{ atoms } \text{Sn}$$

10. How many grams of tin are found in 3.50 moles of tin?

$$? \text{ g } \text{Sn} = 3.50 \text{ mol } \text{Sn} \times \frac{118.7 \text{ g } \text{Sn}}{1 \text{ mol } \text{Sn}} = 415 \text{ g } \text{Sn}$$

Bonus: How many atoms of hydrogen are found in 12.6 moles of water?

$$? \text{ atoms } \text{H} = 12.6 \text{ mol } \text{H}_2\text{O} \times \frac{6.02 \times 10^{23} \text{ molecules } \text{H}_2\text{O}}{1 \text{ mol } \text{H}_2\text{O}} \times \frac{2 \text{ atoms } \text{H}}{1 \text{ molecule } \text{H}_2\text{O}} = 1.52 \times 10^{25} \text{ atoms } \text{H}$$