Name: Key
Date:

Mole Conversions Practice Quiz

Directions: Complete the following calculations. You must show all work and units for full credit. You may use your notes and a calculator.

1. When converting from mole to mass, what number do you use? Write this number as a conversion factor with units.

Molar mass = $\frac{g}{1\,mol}$

* calculate MM from atomic masses on PT

2. When converting from mole to particle (atoms, molecules, formula units), what number do you use? Write this as a conversion factor with units.

$\frac{1\,mole}{6.02\times10^{23}\ formula\ units}$

3. What is the atomic mass of Sulfur?

32.07 amu

4. Calculate the mass for 1 mole of $(NH_4)_2SO_4$

↳ = molar mass

$N = (14.01\,g/mol)(2) = 28.02\,g/mol$

$H = (1.01\,g/mol)(8) = 8.08\,g/mol$

$S = (32.07\,g/mol)(1) = 32.07\,g/mol$

$O = (15.99\,g/mol)(4) = 63.96\,g/mol$

MM = 132.13 g/mol

5. What is the mass of 0.0045 moles of $(NH_4)_2SO_4$?

$0.0045\,mol\,(NH_4)_2SO_4 \times \frac{132.13\,g}{1\,mol} = 0.59\,g$

6. If you have 5.0g of $(NH_4)_2SO_4$, how many moles are present?

$$5.0\text{g } (NH_4)_2SO_4 \times \frac{1\text{mol}}{132.13\text{ g}} = 0.038\text{mol}$$

7. If you have 2.3g of $(NH_4)_2SO_4$, how many formula units are present?

$$2.3\text{g } (NH_4)_2SO_4 \times \frac{1\text{mol}}{132.13\text{g}} \times \frac{6.02\times10^{23}\text{ Formula units}}{1\text{mol}} = 1.04\times10^{22}\text{ Formula units}$$

* Challenge *

8. If you have 0.5g of $(NH_4)_2SO_4$, how many ***hydrogen atoms*** are present?

$$0.5\text{g } (NH_4)_2SO_4 \times \frac{1\text{mol}}{132.13\text{g}} \times \frac{6.02\times10^{23}\text{ Formula units}}{1\text{mol}} \times \frac{8\text{ H atoms}}{1\text{ Formula unit}} = 1.82\times10^{22}\text{ Hydrogen atoms}$$