# Mole Problem Review

1. Describe one mole of Neon gas in terms of how much it would weigh, how many atoms it would contain, and what volume it would occupy.

1 mole of Ne weighs 20.18g, has $6.02 \times 10^{23}$ atoms, and occupies a volume of 22.4L

About how much would a half a mole of Ne weigh?

A half of a mole would weigh half of 20.18g or 10.09g

2. What volume would 45.0 g of $Cl_2$ gas occupy?

$$\frac{x\ L}{22.4\ L} = \frac{45.0\ g\ Cl_2}{70.906\ g}$$

$$\boxed{x = 14.2\ L}$$

3. What does 0.750 moles of $KNO_3$ weigh?

$$\frac{x\ g}{101.10\ g} = \frac{0.750\ moles\ KNO_3}{1\ mole}$$

$$\boxed{x = 75.8\ g\ KNO_3}$$

4. How many molecules are in 10.0 g of silver chloride? (AgCl)

$$\frac{x\ molecules}{6.02 \times 10^{23}\ molecules} = \frac{10.0\ g\ AgCl}{143.32\ g}$$

$$\boxed{x = 4.2 \times 10^{22}\ molecules}$$

5. How many grams would 3.50 moles of carbon dioxide weigh? ($CO_2$)

$$\frac{X\ g}{44.01 g} = \frac{3.50\ moles\ CO_2}{1\ mole\ CO_2}$$

$$\boxed{X = 154.0 g}$$

6. How many moles is 17.5 g of calcium carbonate? ($CaCO_3$)

$$\frac{X\ moles}{1\ mole} = \frac{17.5 g\ CaCO_3}{100.09 g}$$

$$\boxed{X = 0.175\ moles}$$

7. How much would $4.2 \times 10^{23}$ molecules of nitrogen dioxide weigh? ($NO_2$)

$$\frac{X\ g}{46.0055 g} = \frac{4.2 \times 10^{23}\ molecules\ NO_2}{6.02 \times 10^{23}\ molecules\ NO_2}$$

$$\boxed{X = 32.1 g}$$

8. How many grams does 43.0 liters of sulfur trioxide weigh? ($SO_3$)

$$\frac{X\ g}{80.06 g} = \frac{43.0 L\ SO_3}{22.4 L}$$

$$\boxed{X = 153.69 g}$$

9. Describe a mole in your own words.

One mole is a specific number of particles. Like the measurement unit of a dozen, it is always the same # of things. It is $6.02 \times 10^{23}$ of anything.