

5.8.20

Conversions: Grams to Moles

Today's Objectives:

- Define a mole
- Call back unit conversions
- Use the PT to convert grams to moles



What is a mole anyway?

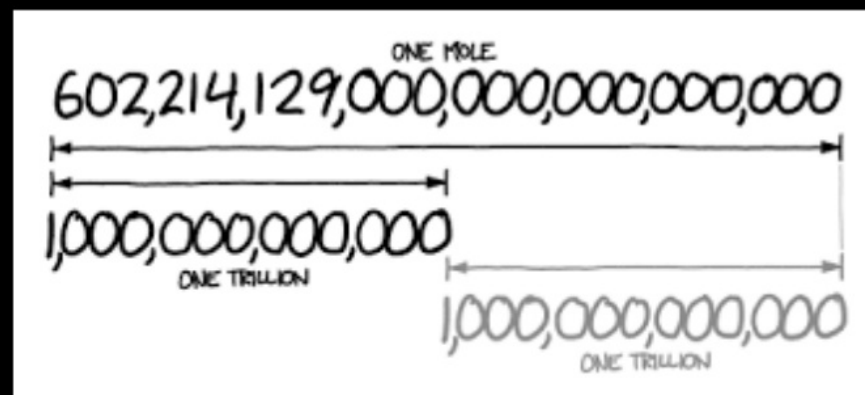
1 dozen = 12 of something



2 dozen:

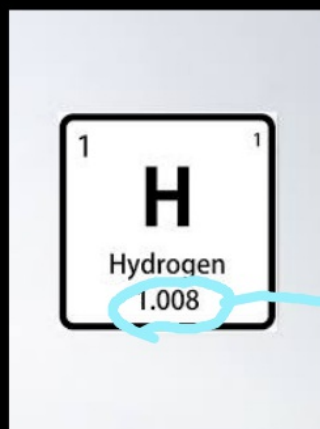
$$2 \times 12 = 24$$

1 mole = 6.02×10^{23} of something.

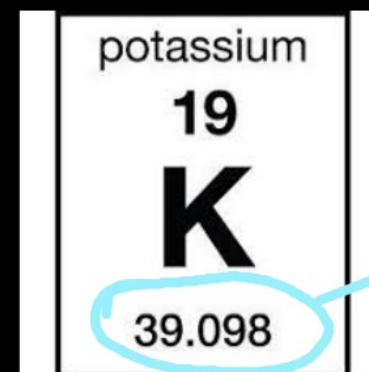


How heavy is 1 mole? Molar Mass (aka Gram Formula Mass)

- Use the atomic mass (decimal on PT)
-
- Different for every element!



1 mole of H = 1 gram



1 mole of K = 39 g

Au

1 mole of gold has a mass of 197 g.

5 moles of gold has a mass of 985 g.

5 moles Au		197 g Au	
		1	mol Au

= 985 g Au

How many grams are in 1 mole of NaCl?

$$\text{Na} : 23 \times 1 = 23$$

$$\text{Cl} : 35.4 \times 1 = 35.4$$

$$\hline 58.4 \text{ g}$$

How many grams are in 1 mole of CO_2 ?

$$\text{C} : 12 \times 1 = 12$$

$$\text{O} : 16 \times 2 = 32$$

$$\hline 44 \text{ grams.}$$

How long would it take you to drink 1 mole of water? H_2O

$$H: 1 \times 2 = 2$$

$$O: 16 \times 1 = 16$$

18 grams

18 mL of Water = 1 sip

200 grams of H_2O is how many moles of water?

$$\frac{200 \text{ g H}_2\text{O}}{18 \text{ g H}_2\text{O}} \times \frac{1 \text{ mol H}_2\text{O}}{1 \text{ mol H}_2\text{O}}$$

$$11.11 = \text{mol H}_2\text{O}$$

100 grams of O_2 is how many moles of oxygen?

$$\frac{100 \text{ g O}_2}{32 \text{ g O}_2} \times \frac{1 \text{ mol O}_2}{1 \text{ mol O}_2}$$

$$3.125 = \text{mol O}_2$$

