

So, moles are interesting, but why do we need them?



- Counting molecules is impossible, but there is another way to find out how many moles we have:

1.0g of hydrogen contains  $6.02 \times 10^{23}$  atoms of hydrogen.

12.0g of carbon contains  $6.02 \times 10^{23}$  atoms of carbon

88.9g of yttrium contains  $6.02 \times 10^{23}$  atoms of yttrium

197.0g of gold contains  $6.02 \times 10^{23}$  atoms of gold

The mass of one mole of any element is equal to its atomic mass in grams

Complete the following table

Element	Molar mass (g)
Sc	45.0
Pt	195.1
Mg	24.3
Ne	20.2
Al	27.0

- The same concept can be used to find the molar mass of compounds:  
Eg. Find the molar mass of  $ZnSO_4$

First - find out how many moles of each element are present

Zn = 1 mole

S = 1 mole

O = 4 moles

Then - find the mass of the component elements

$$Zn = 1 \text{ mole} \times \underline{65.4} = 65.4 \text{ g}$$

$$S = 1 \text{ mole} \times \underline{32.1} = 32.1 \text{ g}$$

$$O = 4 \text{ moles} \times \underline{16.0} = 64 \text{ g}$$

$$65.1 + 32.1 + 64 = 161.2 \text{ g}$$

Total molar mass = 161.2g

Find the molar mass for each of the following compounds:

