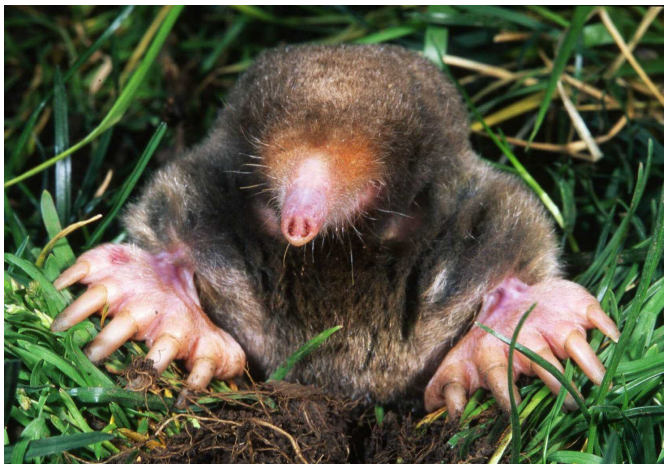


Austin Powers THE MOLE.mp4

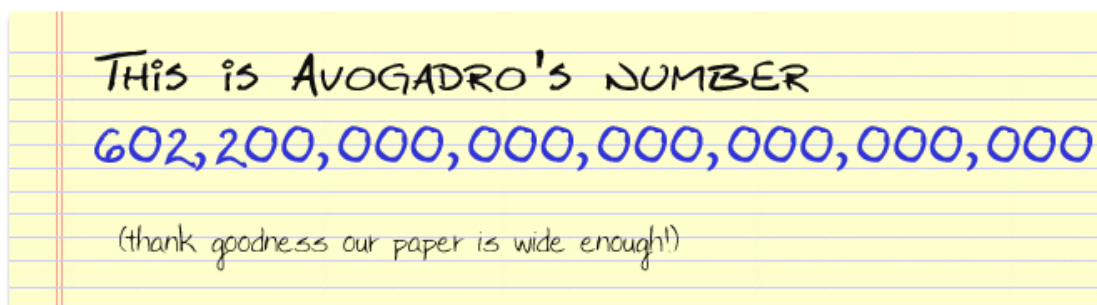


Atoms, molecules and holy Mole (y)!!!



What is a mole?

- a unit of measurement
- 6.02×10^{23} particles (Avogadro's number) make up a mole (602 hexillion)





a HUGE number!!!!!!!

- 1 mol \$ = each person on Earth gets 200 000 billion \$
(multiply 1 dollar bill by 6.02×10^{23})

1 mol peas = 250 planets the size of Earth, 1m deep

1 mol blood cells = > all blood cells in all humans on Earth

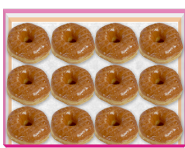
1 mol sand = all sand on Miami Beach

1 mol inches = 8 round trips of the galaxy

The difference between atoms and molecules:

- Ca = an atom, no chemical bond
- CaCl_2 or O_2 = a molecule (more than one atom bonded together)

A dozen donuts = 12 A dozen bagels = 12



1 cup of sugar = 236mL 1 cup of rice = 236mL



1 mole of Cu =
 6.02×10^{23}

1 mole of Zn =
 6.02×10^{23}

1 mole of CaCl_2 =
 6.02×10^{23}

1 mole of O_2 =
 6.02×10^{23}

- Does the dozen donuts weigh the same as the dozen bagels? **NO**
- Does 1 cup of sugar weigh the same as 1 cup of rice? **NO**
- Does 1 mole Cu weigh the same as 1 mole of Zn? **NO**

Molar Mass

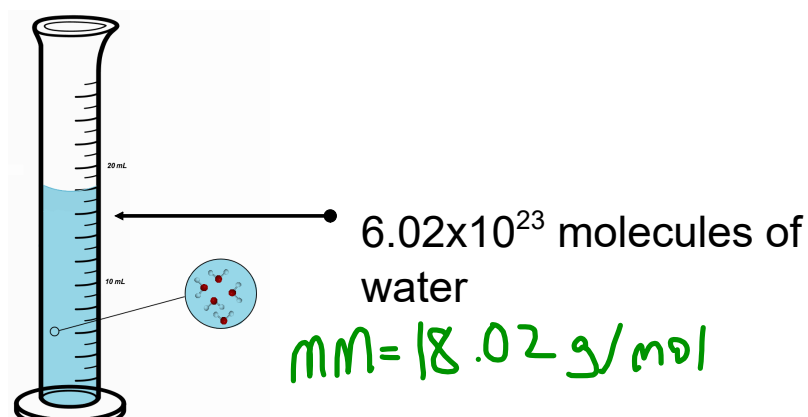
- mass of one mole of a substance measured in g/mol
- molar mass of compounds - add up molar masses of each individual atoms. Use atomic mass on PT.

C	KF	CaCO ₃
12.01g/mol	39.10 + 19.00 = 58.10g/mol	40.08 + 2.01 + 3(16.00) = 100.09g/mol

Molar Mass of water = 18.02 g/mol

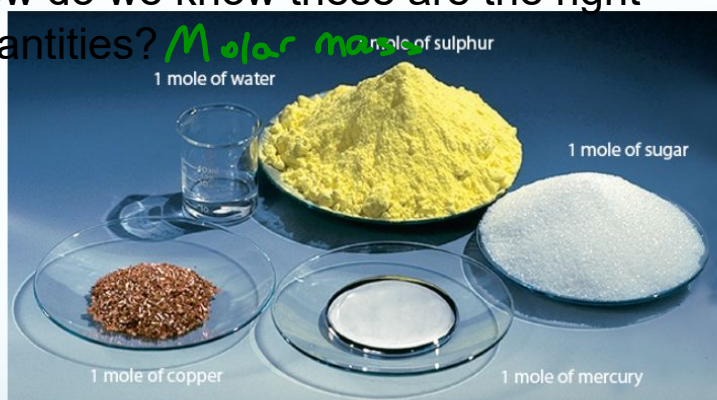
1 mol of H₂O = 6.02x10²³ molecules

In 18.02 g of water there are 6.02x10²³ molecules.



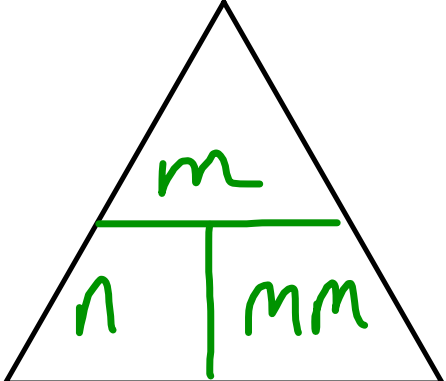
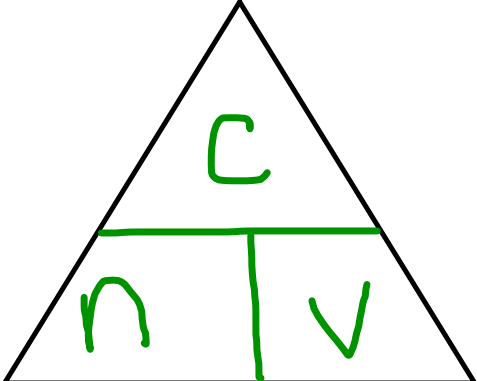
Moles of Particles

How do we know these are the right quantities?
Molar mass



In one mole of a substance, there are
6 x 10²³ particles

Need for next week Moles formulas

Mole formula #1	Mole formula #2
$n = m/mm$	$n = C \times V$
<ul style="list-style-type: none"> • n= moles, unit is mol • m= mass, unit is g • mm= molar mass, unit is g/mol 	<ul style="list-style-type: none"> • n= moles, unit is mol • C= molarity, molar concentraion or solution, unit is mol/L or M • V= volume, unit is L
<p>Use when mass given in word problem</p>	<ul style="list-style-type: none"> • Use when mol/L given in problem • Can also be solved using a ratio instead of formula
	

Things to MEMORIZE

- Molarity and molar concentration means the same thing. Unit is mol/L or M.
- Volume question unit must be in L.
- Atom or molecule question 6.02×10^{23} must be used in answer.
- If there is a 'g' unit in the question the formula $n = m/M$ is always used first.
- If there is a 'mol/L' unit in the question it can be solved using $n = C \times V$ or as a ratio.
- To convert mL to L \div by 1000
- To convert mg to g \div 1000

Attachments

 Austin_Powers_THE_MOLE.mp4

 Austin_Powers_THE_MOLE.mp4

 Austin_Powers_THE_MOLE.mp4