

6.4 n.mi	2000 yd	3 ft	1 mi
	1 n.mi	1 yd	5280 ft

the atom is so small that we can't directly measure it

The Mole - unit used to relate # of particles to their mass

→ mole = very large

Avogadro's number - based on gasses

a pair = 2

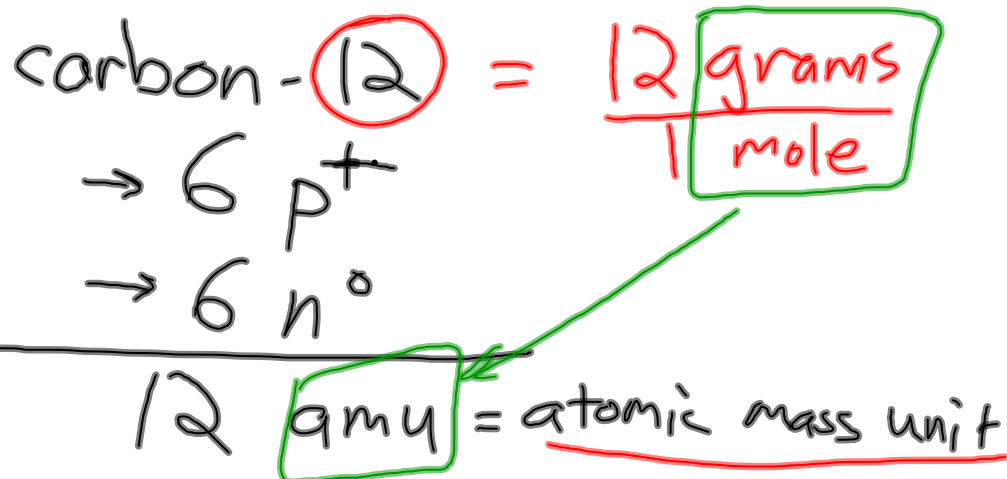
a dozen = 12

a gross = 144

a mole = $6.02 \times 10^{23} =$

602,000,000,000,000,000,000,000

Amadeo Avogadro
 - # of particles in gasses



a couple = 2

a pair = 2

a dozen = 12

a gross = 144

a mole = 6.02×10^{23}

602,000,000,000,000,000,000,000

the mole is SO LARGE because
 atoms are so small

C 12.011 $\boxed{\text{g/mol}}$ - unit of molar mass

H₂O

$$2 \text{ H} = 2 \times 1.0079 \text{ g/mol}$$

$$1 \text{ O} = 1 \times 15.999 \text{ g/mol}$$

$$18.0148 \text{ g/mol}$$

$$\boxed{18.015 \text{ g/mol}}$$

Aluminum sulfate

Al³⁺

SO₄²⁻

2 Al =

3 S =

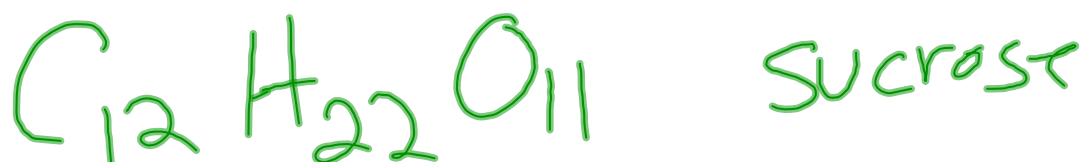
12 O =

Al₂(SO₄)₃

342.147 $\frac{\text{g}}{\text{mol}}$



$$\begin{array}{r} 2 \text{ H} = 2 \times 1.0079 \\ 1 \text{ O} = 1 \times 15.999 \\ \hline 18.0148 \end{array}$$



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

$$22 \text{ H} = 22 \times$$

$$11 \text{ O} = 11 \times$$

$$\hline 342.2948 \text{ g/mol}$$

Carbon - 12

6 protons

6 neutrons

12 nucleons

amu = atomic mass unit

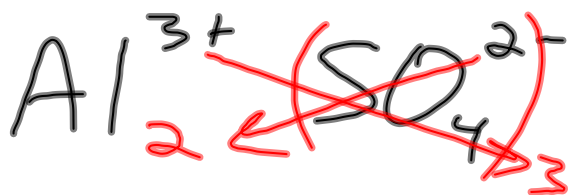
grams / mole

allows us to convert
between mass + # of particles

CO₂

$$\begin{array}{r}
 1 \text{ C} \quad 1 \times 12.011 \text{ g/mol} \\
 + 2 \text{ O} \quad + (2 \times 15.999) \text{ g/mol} \\
 \hline
 44.009 \text{ g/mol}
 \end{array}$$

aluminum sulfate



2 Al	2 × 26.982	g/mol
3 S	3 × 32.065	g/mol
12 O	+ 12 × 15.999	g/mol
342.147		g/mol

6.4 n. mi	2000 yds	3 ft	1 mi.
	1 n. mi	1 yd	5280 ft

$= 7.3 \text{ mi}$

The mole - a unit that relates mass to the # of particles in a substance

a pair = 2

a dozen = 12

a gross = 144

a ream = 500

a mole = 6.02×10^{23}

602,000,000,000,000,000,000,000

↳ Avogadro's # is SO LARGE

because the atom is so small

Amadeo Avogadro

- experimented w/ amounts of gasses

- based on his work, related

of particles to mass

- the mole was developed

Carbon - 12

6 protons
+ 6 neutrons

12 amu = atomic mass unit

12 grams/mole

↳ 6.02×10^{23} particles

CO₂

1 C

1 × 12.011 g/mol

2 O

+ (2 × 15.999 g/mol)

44.009 g/mol

molar mass of CO₂

