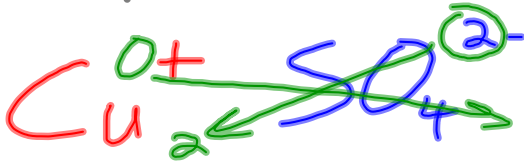


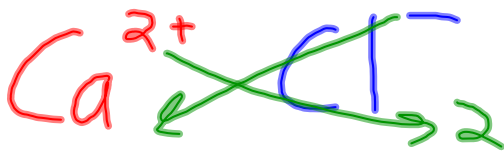
20. copper (I) sulfate



amu
↓

2	Cu	(2 × 63.546)	g/mol
1	S	+ (1 × 32.065)	g/mol
4	O	+ (4 × 15.999)	g/mol
			223.153 g/mol

calcium chloride



The Mole

- Avogadro's # = 6.02×10^{23}
- Unit ~~g~~
mol

Glucose $C_6 H_{12} O_6$

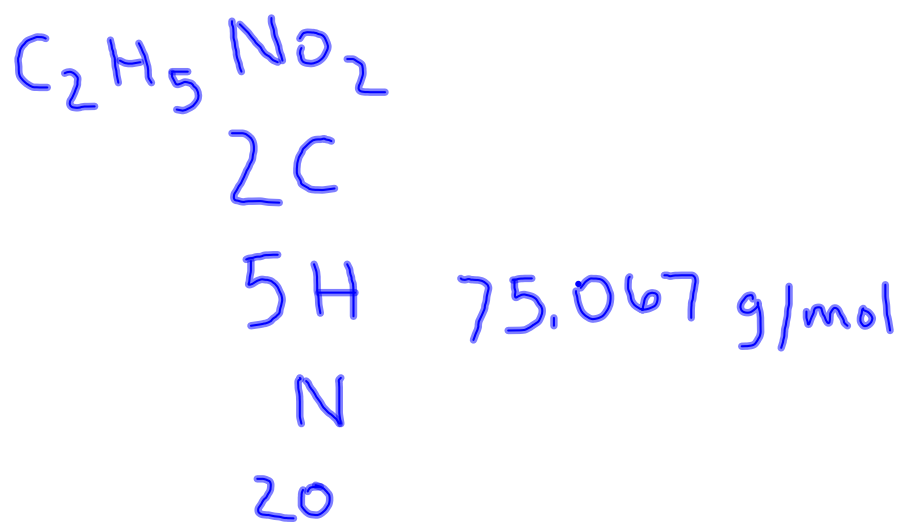
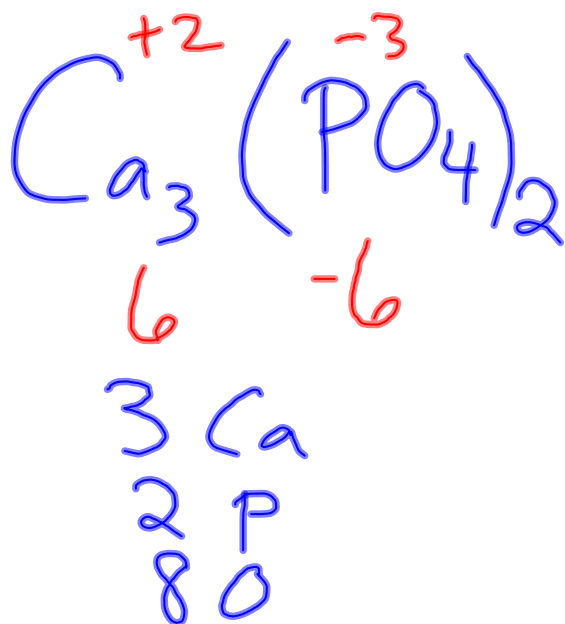
$$6 C = 6 \times 12.011$$

$$12 H = 12 \times 1.0079$$

$$6 O = + 6 \times 15.999$$

$$\begin{array}{r} 180.1548 \\ \hline 180.155 \end{array} \text{ g/mol}$$

180.155 g/mol



Scientific Notation

Pluto: 5,913,520,000 km
 5.913×10^9 km

5,973,600,000,000,000,000,000,000 kg

5.973×10^{24} kg

9.109×10^{-31} kg

~~8,000~~

800,000 cg

8.0×10^5 cg

8×10^5

.000 000 000 000 123

.00864792237 $\cdot 10^{-13}$

8.647×10^{-3}

$$6.02 \times 10^{23}$$

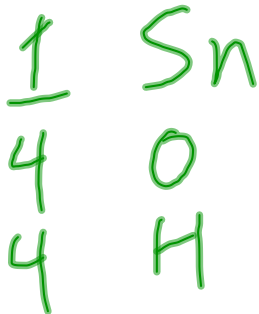
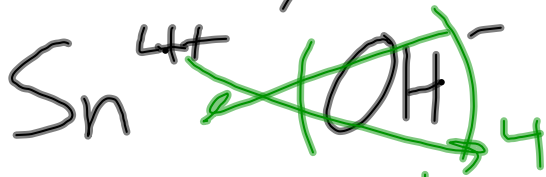
$$6.02 \boxed{EE} 23$$

$$6.02 \boxed{EXP} 23$$



$$\begin{array}{r} 6 \text{ C} \quad (6 \times 12.011) \text{ g/mol} \\ 12 \text{ H} \quad + (12 \times 1.0079) \text{ g/mol} \\ 6 \text{ O} \quad + (6 \times 15.999) \text{ g/mol} \\ \hline 180.155 \text{ g/mol} \end{array}$$

tin (IV) hydroxide



Scientific Notation

- a way to express very large & very small numbers conveniently

i.e., Avogadro's #:

~~602 000 000 000 000 000 000 000~~

put the decimal point after the first non zero digit
 - count spaces to the new decimal point
 - get rid of "padding" zeroes, store in 10

→ 6.02×10^{23}

> 1, exponent is positive

< 1, exponent is negative

Scientific Notation

Mass of Sun:

19900000000000000000000000000000000 kg

Mass of electron:

0.000000000000000000000000000000009109 kg

- a method for simplifying very large & very small numbers
- put a decimal point after the first non zero digit (1-9)
- count places between old & new decimal points, "compress" as a power of 10

Radius of Earth:

6380 km
 = 6.38 × 10³

distance Earth → Sun:

1496000000 km
 = 1.496 × 10⁸ km

Gravitational Constant:

$$\cancel{0.00000000000006673} \text{ N}\cdot\text{m}^2/\text{kg}^2$$

negative if < 1

$$= 6.673 \times 10^{-11} \text{ N}\cdot\text{m}^2/\text{kg}^2$$

distance Earth \rightarrow Moon:

$$3.84 \times 10^5 \text{ km}$$
$$= \underline{384000} \text{ km}$$

charge of electron:

$$-1.602 \times 10^{-19} \text{ C}$$

14 places

$$= -0.00000000000000000001602 \text{ C}$$

$$6.02 \times 10^{23}$$

$$6.02 \boxed{EE} 23$$

$$6.02 \boxed{EXP} 23$$

$$6.02 \boxed{\times} \boxed{10^{\wedge}} 23$$