Particle - mole Relationship

How many are in a...

pair? 2 gross? 144

dozen? 12 ream? 500

mole? 6.02×10^{23} ← Avogadro's Number

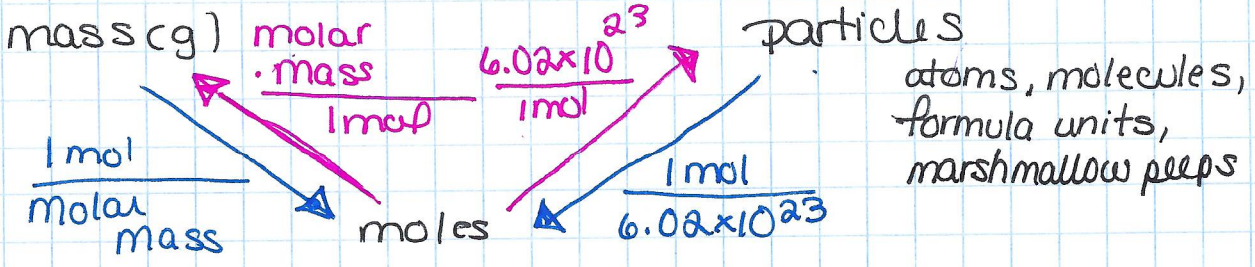
602 000 000 000 000 000 000 000 000

A particle is: . atoms (element)

molecules (covalent compound)

formula units (ionic compound)

$1\ mol = 6.02 \times 10^{23}$ particles



Ex) How many (atoms)? are in 2.46 moles of iridium? (GIVEN)

$$2.46\ \text{mol} \left| \frac{6.02 \times 10^{23}\ \text{atoms}}{1\ \text{mol}} \right. = 1.48 \times 10^{24}\ \text{atoms}$$

How many (moles)? are in 6.97×10^{23} molecules of $C_{12}H_{22}O_{11}$? (GIVEN)

$$6.97 \times 10^{23}\ \text{molecules} \left| \frac{1\ \text{mol}}{6.02 \times 10^{23}\ \text{molecules}} \right. = 1.16\ \text{mol}$$

How many formula units (?) are in .00365 moles (GIVEN) of $Fe_2(Cr_2O_7)_3$?

$$.00365 \text{ moles} \left| \frac{6.02 \times 10^{23} \text{ f.units}}{1 \text{ mol}} \right. = 2.20 \times 10^{21} \text{ f.units}$$

How many moles (?) are in 1.126×10^{22} molecules (GIVEN) of O_3?

$$1.126 \times 10^{22} \text{ molecules} \left| \frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ molecules}} \right. = .02 \text{ mol}$$

1.126 EE 22 ÷ 6.02 EE 23 =

How many atoms (?) are in 100,000 moles (GIVEN) of uranium?

$$100{,}000 \text{ mol} \left| \frac{6.02 \times 10^{23} \text{ atoms}}{1 \text{ mol}} \right. = 6.02 \times 10^{28} \text{ atoms}$$