

4. What is a mole?

an amount

pair? 2

dogen? 12

ream? 500

decade? 10

1 mole = $602,000,000,000,000,000,000$ particles

1 mole = 6.02×10^{23} particles Avogadro's #

atoms (an element)

ions

molecules (covalent compound)

formula units (ionic compound)

5. moles - Particles Relationship (examples)

1) How many moles are in 1.806×10^{25} atoms of copper?

$$\frac{1.806 \times 10^{25} \text{ atoms}}{6.02 \times 10^{23} \text{ atoms}} = 30.00 \text{ mol}$$

2) How many molecules are in 0.828 moles of carbon dioxide?

$$\frac{0.828 \text{ mol}}{1 \text{ mol}} \times 6.02 \times 10^{23} \text{ molecules} = 4.98456 \times 10^{23} \text{ molecules}$$

$$= 4.98 \times 10^{23} \text{ molecules}$$

3) How many formula units (f.units) are in 125.60 moles of Na_3PO_3 ?

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$$\frac{125.60 \text{ mol}}{1 \text{ mol}} \left| \frac{6.02 \times 10^{23} \text{ f.units}}{1 \text{ mol}} \right. = 7.56112 \times 10^{25} \text{ f.units}$$

$= 7.5611 \times 10^{25} \text{ f.units}$

4) How many moles are in 8.26×10^{22} ions of Cr^{3+} ?

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$$\frac{8.26 \times 10^{22} \text{ ions}}{1 \text{ mol}} \left| \frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ ions}} \right. = .137209302 \text{ mol}$$

$= .137 \text{ mol}$

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

particles = atoms, ions, molecules, or formula units

