Scientific Notation

Numbers - decimal

187.650

127 000 000 000.

1.27×10^{11}

$285 = 2.85 \times 10^{2}$

6.02×10^{23}

0.000895

602 000000 21

8.95×10^{-4}

8.95×10^{-7}

$\times 10^{3}$

10^{x}

0.000000895

p. 59 #20 (d)

$1.45 \times 10^{-5} \times 252.10 =$

2 – N	$2 \times 14.01 =$	28.02
8 – H	$8 \times 1.01 =$	8.08
2 – Cr	$2 \times 52.00 =$	104.00
7 – O	$7 \times 16.00 =$	112.00
		252.10

$1.45 \times 10^{-5} \times 2.521 \times 10^{2}$

1.45×2.521 $10^{-5} \times 10^{2}$

3.65545 $\times$ 10^{-3}

Stoichiometry

Recipe- Analogy
- Double
- Reduce

Example-

$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

1 molecule CH_4 combines with 2 molecules O_2
1 molecule CH_4 produces 1 molecule CO_2
and 2 molecules H_2O

1 : 2 : 1 : 2

Example-

How many molecules of CH_4 combine with 20 molec. of O_2?

$$20 \text{ molec. } O_2 \times \frac{1 \text{ molec. } CH_4}{2 \text{ molec. } O_2} = 10 \text{ molecules } CH_4$$

(balanced equation)

Read p.110-117
Questions p.114
#1 (a-c)

Mole ----> Mole Stoichiometry

Recall-

$CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$

Molecules	1	: 2	:	1	:	2
Dozens	1	: 2	:	1	:	2
Moles	1	: 2	:	1	:	2

Example-

How many moles of H_2O are produced when 3.6 moles of CH_4 react?

$$3.6 \text{ moles } CH_4 \times \frac{2 \text{ mol } H_2O}{1 \text{ mol } CH_4} = 7.2 \text{ moles of } H_2O$$

Example-

How many moles CH_4 react with 0.53 mol O_2

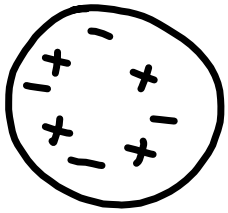
$$0.53 \text{ mol } O_2 \times \frac{1 \text{ mol } CH_4}{2 \text{ mol } O_2} = 0.265 \text{ mol } CH_4$$

Questions-

p.115 #4-6 (Choose)

Models of the Atom-History

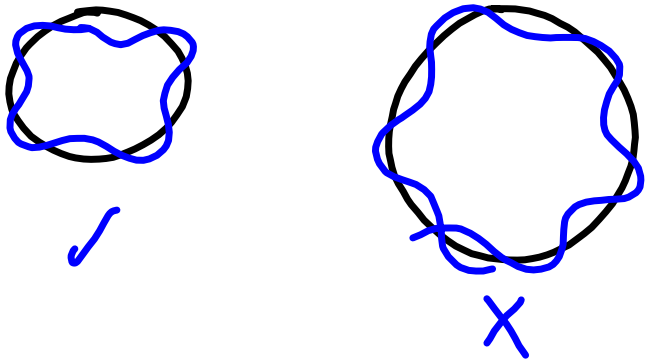
1. Greek → philosophy → atomos (uncut)
2. Dalton/Thomson



3. Rutherford - gold foil experiment
   - nucleus – most of mass and positive charge
   - most of the atom is empty.
4. Bohr
   - based on H atom
   - electrons orbit nucleus
   - evidence: coloured bands of light

Quantum Mechanical Atom

1. Wave mechanical model.



✓ X

Quantum Mechanical-
- Electrons only have certain amounts of Energy (E)

Heisenberg- uncertainty of e^- position/speed