

preceding digit remains unchanged. 8.375 is rounded off to 8.38 while 8.365 is rounded off to 8.36.

Dimensional Analysis During calculations generally there is a need to convert units from one system to other. This is called **factor label method** or **unit factor method** or **dimensional analysis**.

For example- 5 feet and 2 inches (height of an Indian female) is to be converted in SI unit

$$1 \text{ inch} = 2.54 \times 10^{-2} \text{ m}$$

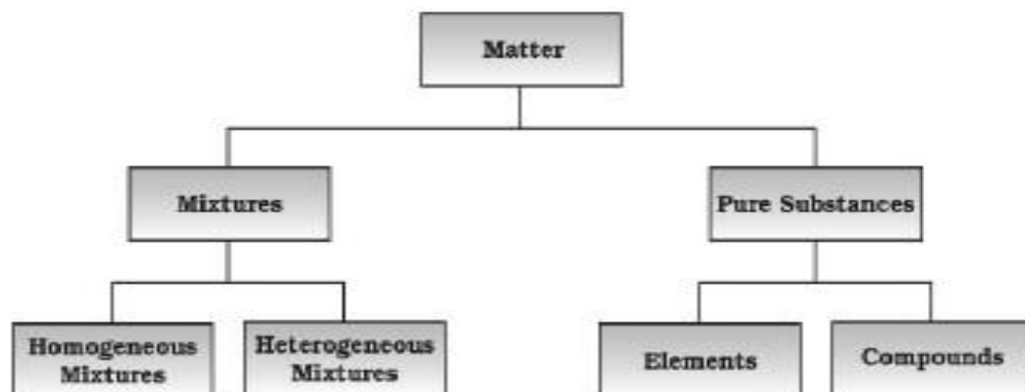
$$1 = \frac{2.54 \times 10^{-2} \text{ m}}{1 \text{ inch}} \quad \text{then, } 5 \text{ feet and } 2 \text{ inch} = 62 \text{ inch}$$

$$= 62 \text{ inch} \times \frac{2.54 \times 10^{-2} \text{ m}}{1 \text{ inch}} = 1.58 \text{ m}$$

Physical Classification of Matter

Properties	Solid	Liquid	Gas
1. volume	Definite	Definite	Indefinite
2. Shape	Definite	Indefinite	Indefinite
3. Inter molecular force of attraction	Very high	Moderate	Negligible / Very low
4. arrangement of molecules	Orderly arranged	Free to move within the volume	Free to move everywhere
5. Inter molecular space	Very small	Slightly greater	Very great
7. Compressibility	Not compressible	Not compressible	Highly compressible
8. Expansion on heating	Very little	Very little	Highly expand
9. Rigidity	Very rigid	Not rigid known as fluid	Not rigid and known as fluid
9. Fluidity	Can't flow	Can flow	Can flow
10. Diffusion	They can diffuse due to kinetic energy of liquid/gases	Can diffuse And rate of diffusion is very fast	Can diffuse And rate of diffusion is very fast

Chemical Classification of matter---



8. State the number of significant figures in each of the following:

(i) 208.91 (ii) 0.00456 (iii) 453 (iv) 0.346

Ans.

(i) 208.91 has five significant figures.

(ii) 0.00456 has three significant figures.

(iii) 453 has three significant figures.

(iv) 0.346 has three significant figures.

8. Express the results of the following calculations to the appropriate number of significant figures.

$$(i) \frac{3.24 \times 0.08666}{5.006} \quad (ii) \frac{(1.36 \times 10^{-4})(0.5)}{2.6}$$

Ans.

$$(i) \frac{3.24 \times 0.08666}{5.006} = 0.05608 = 0.0561$$

$$(ii) \frac{(1.36 \times 10^{-4})(0.5)}{2.6}$$

$$= 0.2615 \times 10^{-4} = 0.3 \times 10^{-4}$$

9. How are 0.50 mol Na₂CO₃ and 0.50 M Na₂CO₃ different?

Ans. Molar mass of Na₂CO₃ = 2 x 23 + 12 + 3 x 16 = 106 g / mol

0.50 mol Na₂CO₃ means 0.50 x 106 = 53 g

0.50 M Na₂CO₃ means 0.50 mol i.e. 53 g of Na₂CO₃ are present in 1 L of the solution.

Three Marks questions with answers-

1. What is unit factor method? Express the following in SI units - 93 million miles (distance between earth and sun)

Ans. Method to convert units from one system to other is called unit factor method.

$$93 \text{ million miles} = 93 \times 10^6 \text{ miles}$$

$$1 \text{ mile} = 1.60934 \text{ km} = 1.60934 \times 10^3 \text{ m}$$

$$1 = \frac{1.60934 \times 10^3 \text{ m}}{1 \text{ mile}}$$

$$93 \text{ million mile} = 93 \times 10^6 \text{ mile} \times \frac{1.60934 \times 10^3 \text{ m}}{1 \text{ mile}}$$

$$= 1.5 \times 10^{11} \text{ m}$$

2. Write the three points of difference between compound and mixture.

Ans.

Compound	Mixture
Constituents are always present in a fixed ratio by mass	Constituents may be present in any ratio
May or may not be homogeneous in nature	Always homogeneous in nature
Constituents can be easily separated	Constituents cannot be easily