

# Chapter 1:

- Each material has properties: Physical and Chemical

→ physical properties :- • shows by itself without interacting with another substance

→ Chemical properties :- • shows as it interacts with or or transforms into another substances

state of matter:

- solid
- gas
- liquid

## Changes :-

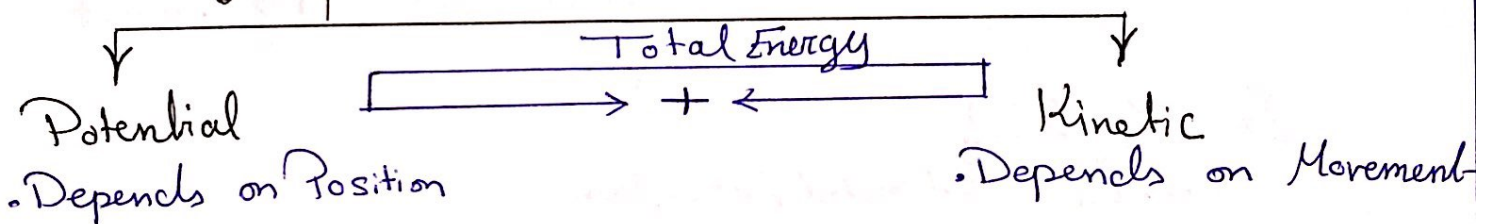
### Physical Changes :-

- Physical form changes
- Composition Does not change
- Reversible :- By temperature

### Chemical Change

- It can't be reversed simply by temperature

## Energy :-



\* Notes:- lower energy states are more stable and are favored

Potential Energy  $\uparrow$  Stability  $\downarrow$

• Remember :- Density =  $\frac{\text{Mass}}{\text{Volume}}$

Temperature :-

It can measured by :-

Kelvin (K) : has only Positive Values

Celsius ( $^{\circ}\text{C}$ ) : It uses The same size degree

• عن زيادة 1 درجة في الكيلفن تكافئ درجة في  
Celsius ولكن للقياسين يأتان من نقطة  
مختلفة

→ Conversions :-

$$T \text{ in K} = T(\text{in } ^{\circ}\text{C}) + 273.15$$

$$T \text{ in } ^{\circ}\text{C} = T(\text{in K}) - 273.15$$

$$T(\text{in } F^{\circ}) = \frac{9}{5} T(\text{in } ^{\circ}\text{C}) + 32$$

Significant Figures :-

- Quantities has   
 → Certain Digits   
 → Uncertain Digits :- rightmost Digit

Ex :  $\underline{5.271}$    
           ↓       ↓   
       Certain   estimated / uncertain

All Digits are Significant except Zeros :-

Significant

- Zeros when Decimal Point is Present Ex: 3500. (4 sig. #)   
                           1.030 (4 sig. #)   
                           0.30 (2 sig. #)

Not Significant

- Zero when Decimal Point is not There and zeros on the left

Decimal Prefixes:-		
tera	$10^{12}$	T
hecto	$10^2$	h
deka	10	da
deci	$10^{-1}$	d
pico	$10^{-12}$	p
femto	$10^{-15}$	f

SI-English Equivalents Quantities.

$$1 \text{ Km} = 0.6214 \text{ mi}$$

$$1 \text{ mi} = 1.609 \text{ Km}$$

$$1 \text{ m} = 39.37 \text{ in}$$

$$1 \text{ ft} = 0.3048 \text{ m}$$

$$1 \text{ gal (Volume)} = 3.785 \text{ dm}^3$$

$$1 \text{ kg} = 2.205 \text{ lb}$$

$$1 \text{ lb} = 0.4536 \text{ kg}$$



# \* Rules for Significant figures In Calculation

→ Multiplication + Division :- الرقم الذي يقوى على اقل عدد من الخانات هو الذي يكم الاجابة النهائية

→ Addition & Substraction :- الرقم الذي يقوى على اقل منازل عشرية يكم عدد المنازل العشرية في الاجابة النهائية

## \* Rounding off :-

Digit Removed

Exact numbers has no uncertainty and Does not limit number of significant figures

more than 5 : The preceding number increases by one

Equals five <sup>was</sup> If it followed with zeros or no digits  
→ If it's Odd : Increases By one  
→ If it's Even : Does not increase

2 If it was followed with nonzero digits The preceding number increases by one

less than five :-

The preceding number is not changed

## Errors

Random  
Values higher and lower than Actual Value

→ Precision

• It has to do with the Series

• You compare the series of results to each other

→ Accuracy

• refers to the actual value

• You compare to the actual value.

Systematic

Values either all higher or all lower than the Actual values