

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 :-

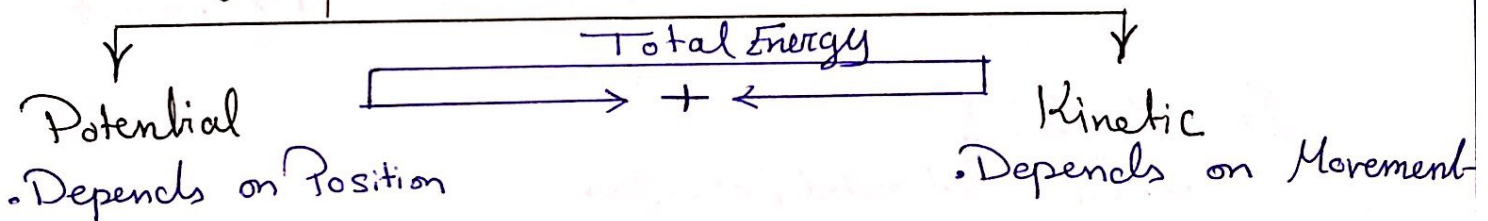
Physical Changes :-

- 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 be measured by :-

Kelvin (K) : has only positive values

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

• بعض زياده ا درجة في الكيلفن تكافئ ا درجة في Celsius
و لكن للقياسين بيان من نقطة مختلفة

↳ Conversions :-

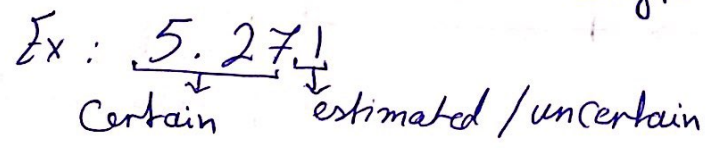
• $T \text{ in K} = T \text{ (in } ^{\circ}\text{C)} + 273.15$

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

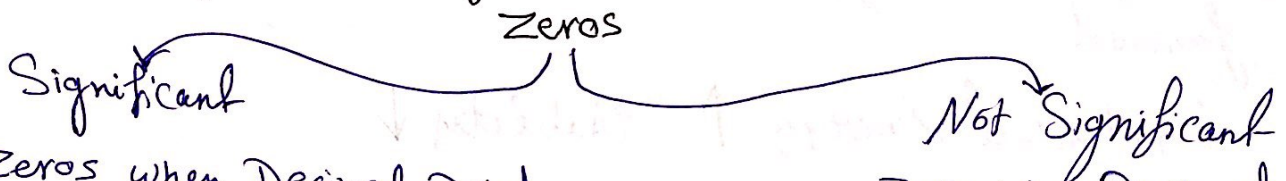
• $T \text{ (in } F^{\circ}) = \frac{9}{5} T \text{ (in } ^{\circ}\text{C)} + 32$

Significant Figures :-

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



All Digits are Significant except Zeros :-



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

- 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 Km	= 0.6214 mi
1 mi	= 1.609 Km
1 m	= 39.37 in
1 ft	= 0.3048 m
1 gal (Volume)	= 3.785 dm ³
1 kg	= 2.205 lb
1 lb	= 0.4536 kg

* Rules for Significant figures In Calculation

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

→ Addition & Substraction :- الرقم الذي يتوي على اقل منازل عشرية يتم عند المناد 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 \square If it followed with zeros or no digits
 → if it's Odd : Increases By one
 → if it's Even : Does not increase

\square 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