

Q. 1. Write a note in significant figures.

Ans. All digits that are certain plus one which contains some uncertainty are said to be significant figures. It gives only a rough estimate of uncertainty.

Eg. In reading value on burette where smallest graduation is 0.1 ml figure 1.4 can be read with uncertainty. The second decimal is estimated by mentally dividing the smallest division into 10 equal parts. Final reading of 1.42 ml contains 3 significant figures 2 certain and 1 with some uncertainty.

Eg. If a volume is recorded as 12.346 ml another person will assume that volume was measured with buret with graduations at 0.01 ml intervals and 3rd decimal was estimated by reading between graduations.

Q. 2. How to recognize significant figures.

Ans. Digit zero '0' may or may not be significant figure depending upon its function in number.

Eg. In buret reading of say 10.06 ml both zeros are measured no. and are therefore significant figures. Therefore No. contains 4 significant figures.

Eg. Volume is expressed in liters i.e. 0.01006 Lt. Number of significant figures is not increased by changing unit of volume. No. of significant figure is still 4. Function of initial zero is to locate decimal point. So initial zero's are not important. Usually we place zero before decimal as 0.01006.

Terminal Zero's are significant:

Eg. Wt. of 10.2050 contains 6 significant figures. When it is important to use terminal zero's only to locate decimal properly, powers may be used to avoid confusion with regard to no. of digits that are significant.

Eg. A weight of 24.0 g expressed as mg should not be written as 24000 say as 24.0×10^3 or 2.40×10^4 .

Q. 3. Define the following terms ?

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|--------------|------------|---------------------|-------------------|
| 1. Titration | 2. titrant | 3. Titrant /analyte | 4. equivalence pt |
| 5. Indicator | 6. End pt. | 7. Std solution | 8. Concentration. |

Ans.

- 1. Titration:-** measuring the volume of titrant required to reach equivalence point.
- 2. Titrant:-** solution of accurately known concentration used in titration is called titrant
- 3. Titrant/Analyte:-** the solution of substance to be determined by titrant is called Analyte/titrant.
- 4. Equivalence point:-** point at which reaction is just complete in a titration is called Eq. point or stoichiometric point.
- 5. Indicator:-** substance which helps in visual detection of completion of titration.
- 6. Standardization :-** process by which concentration of a solution is accurately determined is called standardization.
- 7. End point:-** point at which indicator gives a visual colour change.
- 8. Standard solution :-** solution of accurately known concentration
- 9. Concentration:-** It is the term which indicates amount of solute that is present in known quantity of solvent

Q. 4. What are methods of expressing concentration of a solution?

Ans.

- 1. Normality (N):-** It is defined as no. of gm equivalent weight of substance dissolved in 1 lit. of solution.
Equivalent weight.- equivalent weight of a solution is that part by wt. of substance which combines or liberates 8 moles of oxygen or 1.008 moles/wt. of hydrogen.

2. **Molarity:-** No. of gm molecules wt. of substance dissolved in 1 lit. of solution.

$M = n/v$ no of moles of a solute in v lit. of solution

mW = Mol. Wt of solute

$n = g/mw$

$$\therefore M = \frac{g}{mW \times v}$$

3. **Molality:-** It is defined as no. of gm mol. Wt. of substance dissolved in 1000 g of solvent.

4. **Wt/lit:-** It indicates amount of solute in 1 lit of solvent.

5. **%:-** It indicates amount of solute in 100 g or 100 ml of solvent. % is expressed in following ways:- % by v/w, % by v/v, % by w/v, % by w/w

$A + tT \rightarrow \text{Products}$ A = analyte, T= Titrant

when $A = T$ it refers to Eq. pt.

Wt%:- It is used to express approximate concentration of lab reagent. It specifies no. of g of solute/100 g of solution.

$$p = \frac{W}{W + W_0} \times 100 \quad p = \% \text{ by wt of solute}$$

W = no. of gms of solute

W_0 = no. of gms of solvent