

* Significant Figures

• Rules for determining significant figures

- 1) All digits are significant except zero at the beginning of the numbers.
- 2) The zeros to the right of the decimal points are significant.
eg :- 200.0 has 4 significant figures.
- 3) The zeroes to the left of the first non zero digit in a number are not significant.
eg :- 0.0012 has 2 significant figures.
- 4) All zeroes between two non zero digits are significant.
eg :- 3.005 has 4 significant figures.
- 5) All zeroes at the end or right of a number are ~~signifi~~ significant provided they are on the right side of the decimal point.
eg :- 1) 0.00430 has three significant figures.
2) 3000 - 1 significant figure (no decimal point)
3) 3.0×10^3 - 2 significant figure
- 6) Number written in scientific notations are significant.
eg :- 3.02×10^4 = 3 significant figures.

* Uncertainty in measurement

- Precision - Refers to the closeness of a set of values obtained from identical measurements of quantity
- Accuracy - Reflects how close a measurement is to a known or accepted value.

eg:- If you weigh a given substance 5 times, and get 3.2 kg each time then your measurement is very precise. Precision is independent of accuracy.

Accuracy is close to the true value. If we measure 0.500 g weighed object, then the value got be 0.501 g of 0.500 g, the measurement can be considered as both accurate and precise.

* Scientific notation

Scientific notation is a way of expressing numbers that are too large or too small to be conveniently written in decimal form.

In general scientific notation a number is expressed in the form of $N \times 10^n$ where N is called digit term between 1.000 and 9.999 and ' n ' is a number called exponent.

Scientific notation is mathematically equal to original number.

$$\text{eg:- } 5325.76 = 5.32576 \times 10^3$$

$$0.000532576 = 5.32576 \times 10^{-4}$$

$$10^0 = 1$$

$$10^1 = 10$$

$$10^2 = 100$$

$$10^3 = 1000$$

$$10^4 = 10,000$$

$$10^{-1} = 0.1 \left(\frac{1}{10} \right)$$

$$10^{-2} = 0.01 \left(\frac{1}{100} \right)$$

$$10^{-3} = 0.001 \left(\frac{1}{1000} \right)$$

$$10^{-4} = 0.0001 \left(\frac{1}{10000} \right)$$

Branches of Chemistry

- 1) Organic chemistry - deals with the study of hydrocarbons.
- 2) Inorganic chemistry - deals with the synthesis and behaviour of inorganic and organometallic compounds.
- 3) Physical chemistry - Theoretical explanation of physical and chemical properties.
- 4) Analytical chemistry - studies and uses instruments and methods used to separate, identify and quantify matter.
- 5) Industrial chemistry (Applied chemistry) - Production and application of industrial products.
- 6) Nuclear chemistry - study of nuclear reactions.
- 7) Biochemistry - is both life science and a chemical science. It explores the chemistry of living organisms.
- 8) Environmental chemistry - is the scientific study of the chemical and biochemical phenomena that occur in natural places.
- 9) Industrial chemistry - Manufacturing art concerned with the transformation of matter into useful materials in useful amounts.
- 10) Polymer chemistry - chemical synthesis, structure and chemical and physical properties of solids.