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# Sanjiv Refresher

# SCIENCE

## CLASS X

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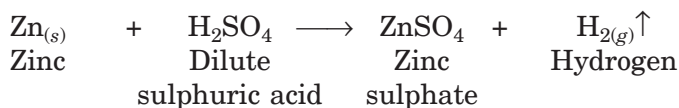
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(iv) **Evolution of gas** : Some chemical reactions are accompanied with evolution of a gas.

**For example :**



- **Chemical equations** : Representation of a chemical reaction in terms of symbols and formulae of the reactants and products is known as chemical equation.

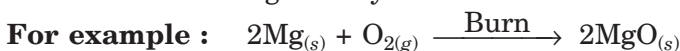
The necessary conditions such as temperature, pressure or any catalyst should be written on arrow between reactants and products. A chemical equation can be made more informative by mentioning reaction conditions (such as temperature, pressure, catalyst), physical states of reactants and products [(s), (l), (g), (aq)], heat absorbed or evolved, concentration of reactants and products [(conc), (aq)].

- **Balanced chemical equations** : The chemical equation in which the no. of atoms of different elements is the same on both sides of the arrow is called a balanced chemical equation. All the equations should be balanced to be in accordance to law of conservation of mass. It states that “Mass can neither be created nor destroyed in a chemical reaction. So, number of elements involved in chemical reaction should remain constant at reactant and product side.”

- **Types of Chemical Reactions**

The chemical reactions can be classified into different types such as :

- (a) **Combination reaction** : The reactions in which two or more substances combine to form a new substance are called combination reactions. These reactions are called synthesis reactions. However, all combination reactions are not synthesis reactions, these reactions are generally exothermic in nature.



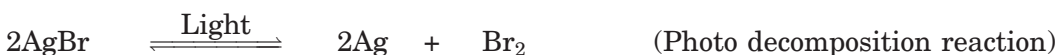
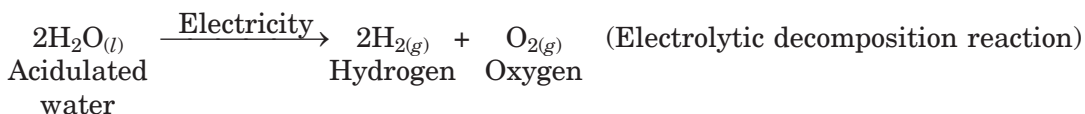
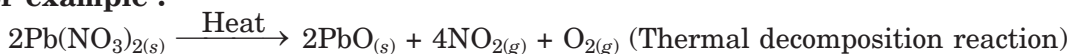
- (b) **Decomposition reaction** : The reaction in which a single compound breaks up into two or more simpler substances are called decomposition reactions. Decomposition reactions are generally endothermic in nature. Energy may be involved in form of heat, light or electricity.

(i) If energy is involved in form of light is called **photo decomposition reaction**.

(ii) If energy is involved in form of electricity is called **electrolytic decomposition reaction**.

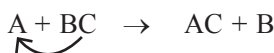
(iii) If energy is involved in form of heat is called **thermal decomposition reaction**.

**For example :**

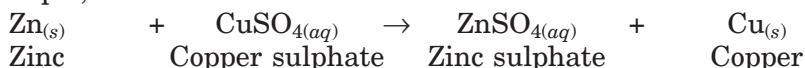


Electrolysis is the decomposition of a substance by passing electric current through. The decomposition of a substance on heating is known as thermal decomposition. The decomposition of a substance by absorbing light energy is called photochemical decomposition.

**(c) Displacement reaction :** The chemical reactions in which a more reactive element displaces a less reactive element from a compound are known as displacement reactions. Displacement reactions are also called substitution reactions.

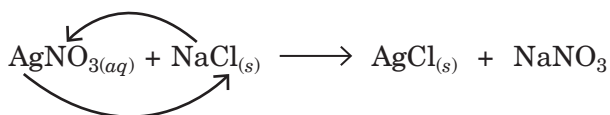


For example,

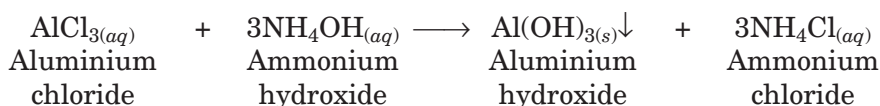


**(d) Double displacement reaction :** The chemical reactions in which compounds react to form two different compounds by mutual exchange of ions are called double displacement reactions.

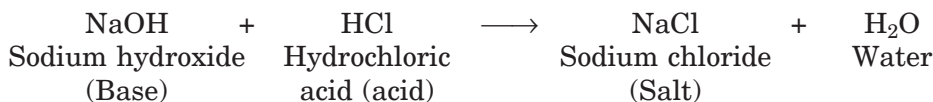
For example :



**(e) Precipitation reaction :** In this reaction, aqueous solution of two salts are mixed whereby some salts precipitate due to mutual exchange of ions between the two salts. The substance that separates out as precipitate is indicated by a downward arrow ( $\downarrow$ ). For example,



**(f) Neutralisation reaction :** The reaction in which salt and water is formed due to the combination of acid and base. For example,

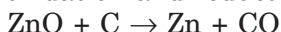


**(g) Redox reaction :** Chemical reaction which shows both oxidation and reduction reaction.

**(i) Oxidation :** Reaction that involves the gain of oxygen or loss of hydrogen.

**(ii) Reduction :** Reaction that involves the loss of oxygen or gain of hydrogen.

Both oxidation and reduction take place simultaneously and hence called redox reaction. In redox reactions both oxidation and reduction occur simultaneously.



ZnO is reduced to Zn ---- reduction

C is oxidised to CO ----- oxidation

# PRACTICALS

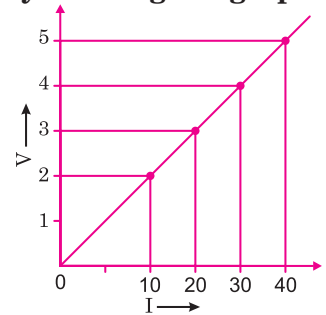
## PHYSICS

### EXPERIMENT - 1

To study the dependence of current (I) on the potential difference (V) across a resistor and determine the resistance, also plot a graph between V and I.

**Q. 1.** Using the readings given in table, verify Ohm's law by drawing the graph.  
**Ans.**

V (Volts)	2	3	4	5
I (Amperes)	10	20	30	40



**Q. 2.** Prepare 8 V battery by using cell of 2 volts, also mention combination between them.

**Ans.** (a)  $\begin{array}{c} 2V \quad 2V \quad 2V \quad 2V \\ + \quad | \quad | \quad | \quad | \quad - \\ | \quad | \quad | \quad | \quad | \end{array}$   
(b) Series combination.

**Q. 3.** Find the least count of a voltmeter in which there are 5 divisions between 2 and 3 volt.

**Ans.** Least count =  $\frac{\text{Range}}{\text{No. of division}} = \frac{3-2}{5} = 0.2 \text{ Volt.}$

**Q. 4.** What is the need of cleaning ends of wires by sand paper?

**Ans.** (i) To remove rust.  
(ii) To increase conductivity current.

**Q. 5.** Why do we use thick wire in circuit?

**Ans.** We know that  $R \propto \frac{1}{A}$ . More the area then resistance will be less. So, thick wire provides resistance.

**Q. 6.** Why is the ammeter connected in series?

**Ans.** An ammeter is a instrument with low resistance, hence, it does not affect the overall current in the circuit.

**Q. 7.** If the least count of ammeter is 5 A. Ammeter has pointer of 12 divisions, then what is the value of the current of ammeter?

**Ans.** We know that reading = Number of division  $\times$  DC current  
 $= 12 \times .5 = 6 \text{ A}$

**Q. 8. Why is voltmeter connected parallel in circuit?**

**Ans.** Voltmeter is an instrument of high resistance. It does not affect the overall current in the circuit.

**Q. 9. Battery of 4.5 volt, resistance of 3  $\Omega$  and 6  $\Omega$  are connected. Select the ammeter must be used in circuit when these resistance are connected in series.**

**Ans.** We know that in series  $R_s = R_1 + R_2$   
 $= 3 + 6 = 9 \Omega$

By Ohm's law,  $V = I R$   
 $4.5 = I \times 9$

$$\frac{4.5}{9.0} = \frac{1}{2} = I$$

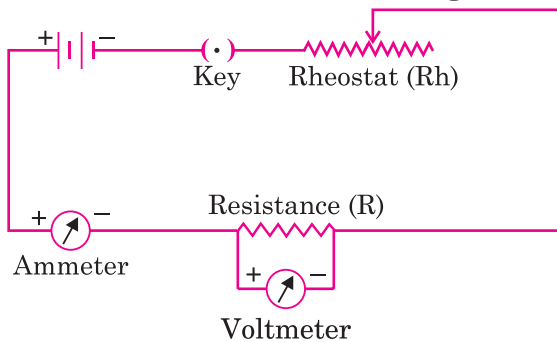
Range of Ammeter to be used = 0-2 A.

**Q. 10. Why is a student advised to keep the circuit open for longer time than to keep it closed.**

**Ans.** We know that resistance also depends on temperature. If we close it for long time, it increases the temperature of wire which changes the value of resistance.

**Q. 11. Draw the labelled current diagram to study Ohm's law.**

**Ans.**



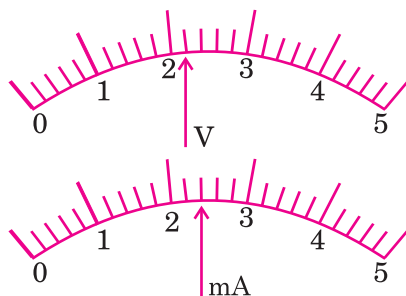
**Q. 12. A voltmeter connected in parallel to a resistance reads 0.1 volt, when no current flows through the circuit. What does it show?**

**Ans.** It shows positive error. It means the observed value is higher than the true value.

**Q. 13. How can we use such type of ammeter and voltmeter which does not have positive and negative terminal.**

**Ans.** Such end which is connected with positive terminal of battery behaves negative, other behaves -ve terminal.

**Q. 14. Calculate the resistance of wire if voltmeter and ammeter show the following reading :**





**Ans.** Least count of voltmeter =  $\frac{1}{5}$

Least count of ammeter =  $\frac{1}{5}$

Reading of voltmeter =  $\frac{11}{5}$

Reading of ammeter =  $\frac{12}{5}$

By Ohm's law

$$V = IR$$

$$\frac{11}{5} = \frac{12}{5} \times R$$

$$\frac{11}{12} = R$$

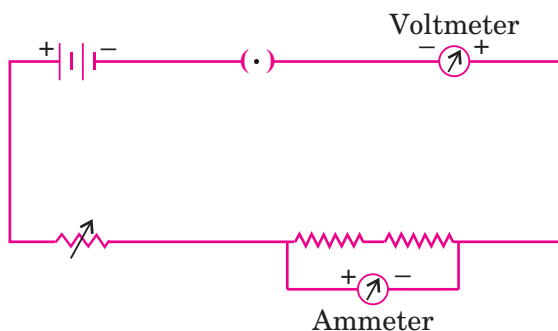
**Q. 15.** Give two ways, how student can change the value of current in circuit?

- Ans.** (i) By increasing or decreasing the number of cells.  
 (ii) By changing the value of resistance.

## EXPERIMENT - 2 and 3

- To determine the equivalent resistance of two resistors when connected in series.
- To determine the equivalent resistance of two resistors when connected in parallel.

**Q. 1.** Select the mistake done by student in circuit.



**Ans.** The student has wrongly connected voltmeter and ammeter. He should have connected voltmeter in parallel and ammeter in series.

**Q. 2.** How does a student get maximum or minimum resistance by connecting resistance of  $5 \Omega$  and  $10 \Omega$ ?

**Ans.** For maximum resistance, the given resistances should be connected in series

$$R_s = R_1 + R_2$$

$$= 5 + 10 = 15 \Omega$$

For minimum, he should connect them in parallel

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$$

$$= \frac{1}{5} + \frac{1}{10}$$

$$= \frac{2+1}{10} = \frac{3}{10}$$

$$R_p = \frac{10}{3} \Omega$$

**Q. 3.** Give two disadvantages of series combination.

**Ans.** (1) Value of resistance will be more.