

# Chapter - 1

## Chemical Reactions and Equations

### ( Assertion and Reasoning Questions )

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**Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:**

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

**Q.1. Assertion (A) :** Decomposition of vegetable matter into compost is an example of exothermic reactions.

**Reason (R) :** Exothermic reaction are those reactions in which heat is evolved.

**Q.2. Assertion (A) :** When HCl is added to zinc granules, a chemical reaction occurs.

**Reason (R) :** Evolution of a gas and change in colour indicate that the chemical reaction is taking place.

**Q.3. Assertion (A) :** Calcium carbonate when heated gives calcium oxide and water.

**Reason (R) :** On heating calcium carbonate, decomposition reaction takes place.

**Q.4. Assertion (A) :** Brown fumes are produced when lead nitrate is heated.

**Reason (R) :** Nitrogen dioxide gas is produced as a by product due to the decomposition of lead nitrate.

**Q.5. Assertion (A) :** White silver chloride turns grey in sunlight.

**Reason (R) :** Decomposition of silver chloride in presence of sunlight takes place to form silver metal and chlorine gas.

**Q.6. Assertion (A):** Pungent smelling gas is produced when sulphur burns in air.

**Reason (R) :** Sulphur trioxide is formed on reaction of sulphur with oxygen.

**Q.7. Assertion (A) :** In a reaction of copper with oxygen, copper serves as a reducing agent.

**Reason (R) :** The substance which gains oxygen in a chemical reaction acts as a reducing agent.

**Q.8. Assertion (A) :** In electrolysis of water, the volume of hydrogen liberated is twice the volume of oxygen formed.

**Reason (R) :** Water ( $H_2O$ ) has hydrogen and oxygen in the ratio of 1:2 by volume.

**Q.9. Assertion (A):** Corrosion of iron is commonly known as rusting.

**Reason (R) :** Corrosion of iron occurs in presence of water and air.

**Q.10. Assertion (A) :** The balancing of chemical equations is based on law of conservation of mass.

**Reason (R) :** Total mass of reactants is equal to total mass of products.

**Q.11. Assertion (A):** In a balanced chemical equation, total mass of the reactants is equal to the total mass of the products.

**Reason (R):** Mass can neither be created nor destroyed during a chemical change.

**Q.12. Assertion (A):** Iron articles are painted so as to prevent them from rusting.

**Reason (R) :** When the surface of iron is coated with paint, its surface does not come in contact with oxygen and moisture therefore rusting does not take place.

**Q.13. Assertion (A) :** Chemical reaction changes the physical and chemical state of a substance.

**Reason (R) :** When electric current is passed through water (liquid), it decomposes to produce hydrogen and oxygen gases.

**Q.14. Assertion (A):** When calcium carbonate is heated, it decomposes to give calcium oxide and carbon dioxide.

**Reason (R):** The decomposition reaction takes place on application of heat, therefore, it is an endothermic reaction.

**Q.15. Assertion (A):** Zinc reacts with sulphuric acid to form zinc sulphate and hydrogen gas and it is a displacement reaction.

**Reason (R):** Zinc reacts with oxygen to form zinc oxide

**Q.16. Assertion (A):** Chips manufacturers usually flush bags of chips with gas such as nitrogen to prevent the chips from getting oxidised.

**Reason (R):** This increase the taste of the chips and helps in their digestion.

**Q.17. Assertion (A):** Exposure of silver chloride to sunlight for a long duration turns grey due to the formation of silver by decomposition of silver chloride.

**Reason (R):** In this process, sublimation of silver chloride takes place.

**Q.18. Assertion (A):** Rusting of iron metal is the most common form of corrosion.

**Reason (R):** The effect of rusting of iron can be reversed if they are left open in sunlight.

**Q.19. Assertion (A):** AgBr is used on photographic and X-ray film.

**Reason (R):** AgBr is photosensitive and changes to Ag and bromine in presence of sunlight and undergoes decomposition reaction.

**Q.20. Assertion (A):** Magnesium ribbon keeps on burning in atmosphere of nitrogen.

**Reason (R) :** Magnesium reacts with nitrogen to form magnesium nitride and this reaction is combination reaction.

**Q.21. Assertion (A):** A lead nitrate on thermal decomposition gives lead oxide, brown coloured nitrogen dioxide and oxygen gas.

**Reason (R):** Lead nitrate reacts with potassium iodide to form yellow ppt. of lead iodide and the reaction is double displacement as well as precipitation reaction.

**-X-X-X-**

### **ANSWER KEY**

**Q.1 :** (a)                      **Q.2 :** (b)                      **Q.3 :** (d)                      **Q.4 :** (a)

**Q.5 :** (a)                      **Q.6 :** (c)                      **Q.7 :** (a)                      **Q.8 :** (c)

**Q.9 :** (b)                      **Q.10 :** (a)

**Q.11 :** (a) This is due to the conservation of mass.

**Q.12 :** (a)                      **Q.13 :** (b)

**Q.14 :** (b)  $\text{CaCO}_3$  on heating gives  $\text{CO}_2$  and  $\text{CaO}$ .

**Q.15 :** (b) Decomposition reaction is a reaction in which a compound breaks down into two or more simpler substances.

**Q.16 :** (c) Nitrogen being antioxidant prevents the chips from being oxidised.

**Q.17 :** (c)                      **Q.18 :** (c)

**Q.19 :** (a)  $\text{AgBr}$  is a chemical compound. It is widely used in photography as photographic emulsions.

**Q.20 :** (a)                      **Q.21 :** (b)