Chemical Reactions and Equations

Assertion & Reason Type Questions

Directions: Each of the following questions consists of two statements, one is Assertion (A) and the other is Reason (R). Give answer:

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q1. Assertion (A): Rusting of iron is endothermic in nature.

Reason (R): As the reaction is slow, the release of heat is barely evident.

(CBSE SQP 2023-24)

Answer: (d) Assertion (A) is false but Reason (R) is true.

Assertion (A) is false because rusting of iron is an exothermic reaction.

Q2. Assertion (A): Burning of natural gas is an endothermic process.

Reason (R): Methane gas combines with oxygen to produce carbon dioxide and water.

(CBSE 2021 Term-1)

Answer: (d) Assertion (A) is false but Reason (R) is true.

Assertion is false because burning of natural gas is an exothermic reaction.

Q3. Assertion (A): Reaction of quicklime with water is an exothermic reaction.

Reason (R): Quicklime reacts vigorously with water releasing a large amount of heat.

(CBSE 2023)

Answer : (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).





Q4. Assertion (A): When an iron rod is dipped into a solution of copper sulphate, copper is displaced.

Reason (R): Iron is more reactive than copper.

Answer : (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

Q5. Assertion (A): Silver bromide decomposition is used in black and white photography.

Reason (R): Light provides energy for this exothermic reaction.

(CBSE SQP 2022-23)

Answer: (c) Assertion (A) is true but Reason (R) is false.

Reason (R) is false because light provides energy for photochemical decomposition reaction.

Q6. Assertion (A): $2H_2S(g) + O_2(g) \rightarrow 2S(s) + 2H_2O(I)$ is a redox reaction.

Reason (R): In this reaction, oxidation of H_2S to S and reduction of O_2 to H_2O takes place.

Answer : (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

Q7. Assertion (A): Rusting can be prevented by applying a layer of oil and grease.

Reason (R): The whole of iron deteriorates due to rust.

Answer : (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

Q8. Assertion (A): Chips manufacturers usually flush bags of chips with gas such as nitrogen to prevent the chips from getting oxidised.

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

Answer : (c) Assertion (A) is true but Reason (R) is false.

Reason (R) is false because this process prevents the chips from getting rancid.





Q9. 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.

Answer: (a)

Q10. 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.

Answer:(b)

Q11. Assertion (A) : Calcium carbonate when heated gives calcium oxide and water.

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

Answer: (d)

Q12. 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.

Answer: (a)

Q13. 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.

Answer: (a)

Q14. Assertion (A): Pungent smelling gas is produced when sulphur burns in air.

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

Answer: (c)

Q15. 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.

Answer: (a)

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Q16. Assertion (A) : In electrolysis of water, the volume of hydrogen liberated is twice the volume of oxygen formed.

Reason (R) : Water (H,0) has hydrogen and oxygen in the ratio of 1:2 by volume.

Answer: (c)

Q17. Assertion (A): Corrosion of iron is commonly known as rusting.

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

Answer: (b)

Q18. 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.

Answer: (a)

Q19. 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.

Answer: (a) This is due to the conservation of mass.

Q20. 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.

Answer: (a)

Q21. 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.

Answer: (b)

Q22. 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.

Answer: (b) CaCO3 on heating gives CO2 and CaO.





Q23. 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

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

Q24. Assertion (A): Chips manufacturers usually Ilush 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.

Answer : (c) Nitrogen being antioxidant prevents the chips from being oxidised.

Q25. 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.

Answer: (c)

Q26. 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.

Answer: (c)

Q27. 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.

Answer : (a) AgBr is a chemical compound. It is widely used in photography as photographic emulsions.

Q28. 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.

Answer: (a)





Q29. 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.

Answer: (b)

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