



CHEMISTRY

BOOKS - ICSE

LANGUAGE OF CHEMISTRY

Exercises A Multiple Choice Questions Exercises

1. Chemical symbol of an element can be derived from its name

- A. first letter
- B. first two letters
- C. Latin name
- D. either of a, b or c

Answer: D



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2. What is the valency of Magnesium?

A. 1

B. 2

C. 3

D. 4

Answer: B



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3. Which of the following elements has only one valency?

A. Phosphorous

B. Iron

C. Oxygen

D. Nitrogen

Answer: C



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4. Valency of a carbonate (CO_3) radical is

A. 2

B. 3

C. 4

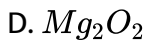
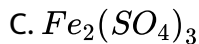
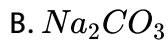
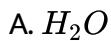
D. 5

Answer: A



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5. Which of the following formula representation is NOT correct?



Answer: D

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Exercises B True Or False Exercises

1. How are the elements with variable valency named ? Explain with an example.

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2. Chemical symbol of hydrogen is H_2 .

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3. Chemical symbol of hydrogen is H_2 .

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4. Word equations provide more information than chemical equations.

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5. Chemical equation can indicate the time taken by the reaction.

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Exercises C Fill In The Blanks Exercises

1. Chemical formula of a compound can be derived, if we know the

And the Of its constituent elements.



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2. is a symbolic representation of a compound.



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3. One atom of hydrogen combines with one atom of chlorine and so the valency of chlorine is



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4. Atomic mass of reactants should be equal to the of products.



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5. Chemical formula magnesium oxide is



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Exercises D Match The Following Exercises

- | | |
|------------------------------------|------------|
| 1. Chemical symbol of potassium | (a) Ca |
| 2. Chemical symbol of calcium | (b) Cu |
| 1. 3. Element with valency 4 | (c) Cu^+ |
| 4. Element with variable valencies | (d) K |
| 5. Cation | (e) C |

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Exercises E Name The Following Exercises

1. Symbolic expression for a molecule is called

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2. Symbolic representation of an element.

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3. Symbolic representation of a chemical reaction.

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Exercises F Diagram Based Questions Exercises

1. Differentiate between :

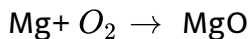
Reactants and products

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2. How can we make a chemical equation more informative?

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3. What is the valency of the two elements involved in this reaction?



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Exercises G Give Reasons For The Following Exercises

1. Chemical equations should always be balanced.

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2. Symbols of some elements contain two letters.

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3. Valency of a radical/ion is same as the number of charges it carries.

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Exercises H Short Answer Questions Exercises

1. What is the importance of a chemical formula? State two points.

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2. Derive the chemical formula of magnesium carbonate and sulphuric acid.

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3. Write a balanced chemical equation for heating potassium nitrate to produce potassium nitrite and oxygen.

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4. What information does a chemical equation provide? State four points.

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5. What are the limitations of a chemical equation ?

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6. How can we make a chemical equation more informative?

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7. What are cations and anions? Give one example of each.

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8. Define the law of conservation of mass. How is it applicable to chemical reactions?

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Test Yourself 1

1. Derive the chemical formula of the following compounds.

1. Calcium oxide 2. Sodium chloride 3. Sulphuric acid 4. Iron sulphide 5.

Water

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Test Yourself 2

1. Write balanced and informative chemical equations for the following reactions.

Iron reacts with sulphur on heating to form iron sulphide.

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2. Write balanced and informative chemical equations for the following reactions.

Magnesium ribbon burns in air to produce magnesium oxide.

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3. Write balanced and informative chemical equations for the following reactions.

When electric current passes through water, it decomposes into hydrogen and oxygen.

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4. Write balanced and informative chemical equations for the following reactions.

Calcium carbonate decomposes into calcium oxide and carbon dioxide when heated.

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5. Write balanced and informative chemical equations for the following reactions.

Dilute hydrochloric acid reacts with calcium to produce calcium chloride and hydrogen.

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Check Your Progress Answer These Questions

1. Write skeletal equations for the following word equations.

magnesium + oxygen \rightarrow magnesium oxide



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2. Write skeletal equations for the following word equations.

hydrogen + chlorine \rightarrow hydrogen chloride



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3. Write skeletal equations for the following word equations.

calcium carbonate \rightarrow calcium oxide + carbon dioxide



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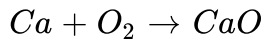
4. Write skeletal equations for the following word equations.

zinc carbonate \rightarrow zinc oxide + carbon dioxide



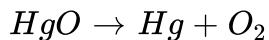
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5. Balance the following equations.



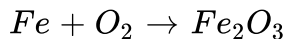
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6. Balance the following equations.



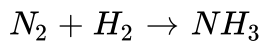
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7. Balance the following equations.



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8. Balance the following equations.





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Exercise Tick The Most Appropriate Answer

1. Which of the following has variable valencies?

A. sodium

B. calcium

C. copper

D. chlorine

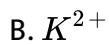
Answer:



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2. Which of the following is a potassium ion?

A. K^{3+}



Answer:

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3. Which of the following is a nitrite ion?



Answer:

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4. What is the chemical formula of ammonia?

A. NH_2

B. NH

C. N_2H

D. NH_3

Answer:



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5. What is the product of the following reaction? $C + O_2 \rightarrow CO_2$

A. C

B. O_2

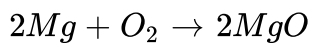
C. CO_2

D. all of these

Answer:

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6. What is the coefficient of MgO in the following reaction?



A. 1

B. 2

C. 3

D. 0

Answer:

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Exercise Fill In The Blanks

1. The _____ of an element is the abbreviation of its full name.

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2. An atom that loses one or more electrons to form a positive ion is called a _____

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3. _____ is a symbolic representation of a compound.

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4. The representation of a chemical reaction by using the symbols and formulae of the reactants and the products involved in the reaction is called its chemical _____

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5. If the number of atoms of each element on both the sides of a chemical equation is equal, then the equation is called a _____ chemical equation .

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6. A _____ is a number that we place in front of a symbol or formula in an equation.

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7. _____ is neither created nor destroyed during a chemical reaction.

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Exercise Write True Or False Correct The False Statements

1. Iron has only one valency.



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2. True or False: When an atom loses or gains electrons, it becomes a charged particle.



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3. True or False: An atom that gains one or more electrons to form a negative ion is called a cation.



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4. A hydroxide ion is a polyatomic ion.



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5. The chemical formulae of different compounds can be written easily if the symbols and the valencies of the elements are known.

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6. The law of conservation of mass states that mass is created during a chemical reaction.

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7. True or False: If heat is evolved during the reaction, it is endothermic.

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Exercise Match The Columns

1. Match the columns

- | | |
|---------------------------|------------------|
| 1. Positively charged ion | a. sulphite ion |
| 2. ZnS | b. anion |
| 3. Valency | c. catalyst |
| 4. MnO_2 | d. zinc sulphide |
| 5. S^{2-} | e. cation |
| | f. whole number |

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Exercise Write The Formulae For The Following

1. What is the molecular formula of aluminium chloride ?

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2. Write the formulae - Magnesium hydroxide

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3. Write the formula of calcium chloride.

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4. Write the formula of sodium carbonate.

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5. Write the formula of Copper(II) oxide.

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6. Write the formula of Iron(II) sulphide.

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Exercise Write The Names Of The Compounds Represented By The Following Formulae

1. The name of $Al_2(SO_4)_3$ is :

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2. K_2SO_4

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3. KNO_3

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4. $CaCO_3$

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5. $MgCl_2$

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Exercise Define The Terms

1. Define - Symbol

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2. Define - Valency

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3. Define - Ion

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4. Define - Cation

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5. Define - Anion

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Exercise Write Chemical Equations In Symbols And Formulae For The Following Word Equations

1. Iron + sulphur \rightarrow Iron(II) sulphide

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2. Write skeletal equations for the following word equations.

magnesium + oxygen \rightarrow magnesium oxide

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3. Write skeletal equations for the following word equations.

calcium carbonate \rightarrow calcium oxide + carbon dioxide



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4. silver chloride \rightarrow silver + chlorine



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Exercise Answer The Following In Short

1. How is a cation formed?



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2. How is an anion formed?



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3. What is a polyatomic ion?



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4. Name the polyatomic ion that carries a positive charge.



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5. What is a chemical formula?



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6. Differentiate between a balanced chemical equation and an unbalanced chemical equation.

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7. State the law of conservation of mass.

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8. Write the symbols for all physical states.

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Exercise Answer The Following In Detail

1. Write the difference between monoatomic ions and polyatomic ions with the help of examples.

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2. What are the rules for writing the formulae of compounds?

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3. Describe a chemical equation with an example.

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4. What are the limitations of a chemical equation ?

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Exercise Balance The Following Equations

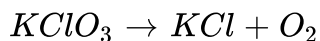
1. Balance the given reaction: $Na + H_2O \rightarrow NaOH + H_2$

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2. Balance the given reaction: $N_2 + O_2 \rightarrow NO$

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3. Balance the following equation :



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4. Balance the given reaction : $NO + O_2 \rightarrow NO_2$

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Exercise

1. Explain the term symbol. State a reason why- the symbol of calcium is Ca and of copper is Cu.

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2. Define the term valency. With reference to water and ammonia as compounds respectively, state the valency of oxygen & nitrogen. Magnesium [2,8,2] has valency 2^+ . Give reasons.

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3. Explain the term variable valency. Copper having electronic configuration 2,8,18,1 exhibits variable valency. Give a reason for the same & name the compound CuCl & $CuCl_2$.

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4. State the valencies of the following metallic elements -a] Potassium b] Sodium c] Calcium d] Magnesium e] Zinc f] Aluminium g] Chromium [write each symbol with the valency]

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5. Certain metals exhibit variable valencies which include valencies 1^+ , 2^+ , 3^+ & 4^+ . State the variable valency of the following metals -a] Copper b] Silver c] Mercury d] Iron e] Tin f] Lead-[Write each symbol with the variable valency]

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6. State which of the following ions or radicals given below of non metallic elements exhibit valency: 1^- , 2^- & 3^- -a] Chloride b] Bromide c] Iodide d] Nitrate e] Hydroxide l] Sulphide m] Sulphite n] Sulphate o] Carbonate p] Dichromate q] Zincate r] Plumbite s] Phosphate t] Nitride-[Write each ion or radical with the correct valency]



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7. Differentiate between the term Ion & radical with suitable examples.



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8. Write the chemical formula of the following compounds in a step by step manner

a. Potassium choride b. sodium bromide c. Potassium nitrate d. Calcium hydroxide e. Calcium bicarbonate f. Sodium bisulphate g. Potassium sulphate h. Zinc hydroxide i. Potassium permanganate j. Potassium dichromate k. Aluminium hydroxide l. Magnesium nitride m. sodium zincate n. copper II oxide o. Copper (I) sulphide p. Iron [III] chloride q. Iron [II] hydrdoxide r] Iron [III] sulphide s. Iron [III] oxide.



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9. What is a chemical equation. How is it represented differentiate between a word equation and a molecular equation with a suitable example.

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10. State the information provided by a chemical equation. Chemical equations suffer from a number of limitations. State the main limitations of a chemical equation.

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11. State what is a balanced equation with a relevant example. Give a reason why an equation is balanced with reference to the law of conservation of matter.

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12. Write balanced molecular equations for the following word equation:

Calcium + oxygen → Calcium oxide

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13. Write balanced molecular equations for the following word equation:

Calcium + water → Calcium hydroxide + hydrogen

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14. Write balanced molecular equations for the following word equation:

Zinc + sulphuric acid → Zinc sulphate + hydrogen

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15. Write balanced molecular equations for the following word equation:

Lead sulphate + ammonium hydroxide → Ammonium sulphate

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16. Write balanced molecular equations for the following word equation:

Copper hydroxide + nitric acid → Copper nitrate + water

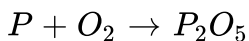
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17. Write balanced molecular equations for the following word equation:

Lead nitrate + sodium chloride → Sodium nitrate + lead chloride

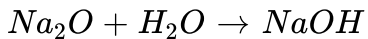
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18. Balance the following equation:



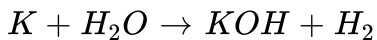
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19. Balance the following equation:



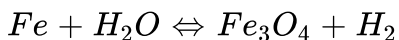
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20. Balance the following equation:



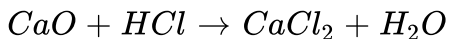
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21. Balance the following equation:



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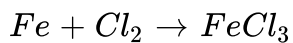
22. Balance the following equation:





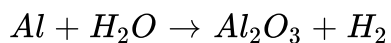
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23. Balance the following equation:



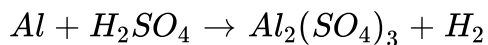
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24. Balance the following equation:



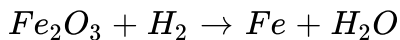
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25. Balance the following equation:



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26. Balance the following equation:



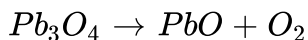
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27. Balance the following equation:



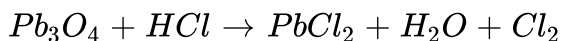
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28. Balance the following equation:



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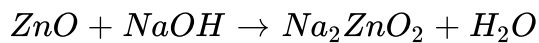
29. Balance the following equation:





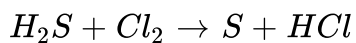
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30. Balance the following equation:



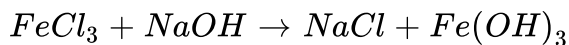
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31. Balance the following equation:



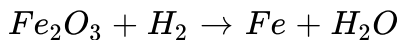
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32. Balance the following equation:



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33. Balance the following equation:



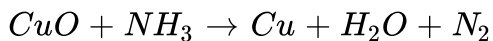
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34. Balance the following equation:



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35. Balance the following equation:



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Objective Type Questions

1. Complete the statements given below by filling in the blank with the correct words.

The formula of silver [I] chloride is _____ [*AgCl* / *AgCl₂*]

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2. Complete the statements given below by filling in the blank with the correct words.

The basic unit of an element is a/an _____ [molecule/atom/ion]

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3. Complete the statements given below by filling in the blank with the correct words.

Atom contains _____ [neutron/nucleus], with positively charged _____ [electrons/protons].

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4. Complete the statements given below by filling in the blank with the correct words.

Element _____ [calcium/lead/carbon] has the symbol derived from its Latin name plumbum.

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5. Complete the statements given below by filling in the blank with the correct words.

From the elements -He, Br, Pt & O, the element which forms a polyatomic molecule is _____ & which is liquid at room temperature is _____

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6. Complete the statements given below by filling in the blank with the correct words.

The valency of iron in FeO is _____ [2^+ / 1^+] of chlorine [chloride] in

$CaCl_2$ is _____ $[1^- / 2^-]$ and of dichromate in $K_2Cr_2O_7$ is _____

$[2^+ / 2^-]$

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7. Match the statements -1 to 10 below with their correct answer from -A to

J

- | | |
|---|------------------|
| 1. Elements having valency of two. | A: Br^{1-} |
| 2. An anion | B: Divalent |
| 3. A gaseous non-metal | C: Reactants |
| 4. A cation. | D: Ammonium |
| 5. The term used for the substances which take part in the chemical reaction | E: Nitric oxide |
| 6. The meaning of the symbol ' Δ ' over the arrow in a chemical equation | F: Nitrogen |
| 7. The chemical name for nitrogen monoxide | G: Zero |
| 8. A radical containing nitrogen & hydrogen only | H: Nitrous oxide |
| 9. The chemical name for dinitrogen oxide | I: Heat required |
| 10. The valency of noble gases | J: K^{1+} |

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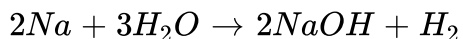
8. Match the compounds in List I -1 to 20 with their correct formulas in

List II -A to T.

1. Copper [I] sulphide	2. Potassium permanganate	3. Phosphoric acid	4. Copper [I] oxide
5. Carbonic acid	6. Aluminium sulphide	7. Iron [III] oxide	8. Iron [III] sulphide
9. Iron [III] sulphate	10. Sodium zincate	11. Nitrous oxide	12. Aluminium sulphate
13. Magnesium nitride	14. Iron [III] sulphate	15. Copper [II] oxide	16. Iron [III] oxide
17. Nitric oxide	18. Copper [II] sulphide	19. Iron [III] sulphide	20. Magnesium nitrate
A. $KMnO_4$	B. Mg_3N_2	C. $Mg(NO_3)_2$	D. $Al_2(SO_4)_3$
E. Na_2ZnO_2	F. N_2O	G. H_2CO_3	H. Al_2S_3
I. NO	J. FeS	K. Fe_2S_3	L. H_3PO_4
M. Cu_2S	N. CuS	O. Fe_2O_3	P. FeO
Q. $FeSO_4$	R. $Fe_2(SO_4)_3$	S. CuO	T. Cu_2O

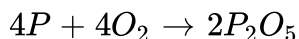
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9. Underline incorrectly balanced compounds in each equation & rewrite the correct equation.



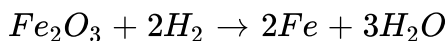
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10. Underline incorrectly balanced compounds in each equation & rewrite the correct equation.



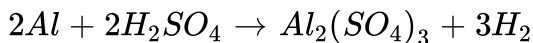
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11. Underline incorrectly balanced compounds in each equation & rewrite the correct equation.



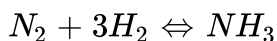
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12. Underline incorrectly balanced compounds in each equation & rewrite the correct equation.



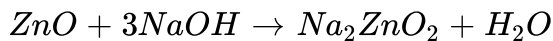
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13. Underline incorrectly balanced compounds in each equation & rewrite the correct equation.



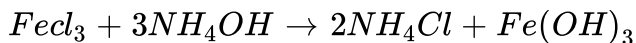
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14. Underline incorrectly balanced compounds in each equation & rewrite the correct equation.



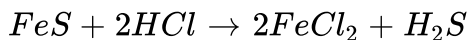
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15. Underline incorrectly balanced compounds in each equation & rewrite the correct equation.



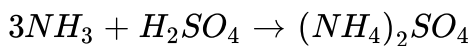
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16. Underline incorrectly balanced compounds in each equation & rewrite the correct equation.



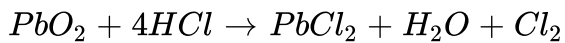
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17. Underline incorrectly balanced compounds in each equation & rewrite the correct equation.



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18. Underline incorrectly balanced compounds in each equation & rewrite the correct equation.



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