**Chemistry**

**Class 9 (lesson wise question bank)**

**Lesson 1: The language of chemistry**

1. What is a symbol? What information does it convey?

2. Why is the symbol S for Sulphur, but Na for Sodium and Si for Silicon?

3. Write the full form of IUPAC. Name the elements represented by the following Symbols: Au, Pb, Sn, Hg

4. If the symbol for cobalt, Co was written as CO. What would be wrong with it?

5. What is meant by atomicity? Name a diatomic element.

6. Explain the terms valency and variable valency.

7. a) What is a chemical formula?

b) What is the significance of a formula? Give an illustrate.

8. What do you understand by following terms?

a) Acid radical b) Basic radical

9. **Select the basic radical in the following compounds**

a) MgSO4

b) (NH4)2

c) Al2(SO4)3

d) ZnCO3

e) Mg(OH)2

10. Write the chemical formulae of sulphates of Aluminium, Ammonium and Zinc.

**11. Match the following**

|  |  |
| --- | --- |
| Compound | Formula |
| Boric acid | NaoH |
| Phosphoric acid | SiO2 |
| Nitrous acid | Na2CO3 |
| Nitric acid | KOH |
| Sulphorous acid | CaCO3 |
| Sulphuric acid | NaHCO3 |
| Hydrochloric acid | H2S |
| Silica (Sand) | H2O |
| Caustic soda (Sodium Hydroxide) | PH3 |
| Caustic potash (Potassium hydroxide) | CH4 |
| Washing soda (Sodium carbonate) | NH3 |
| Baking Soda (Sodium bi carbonate) | HCl |
| Lime stone (Calcium carbonate) | H2SO3 |
| Water | HNO3 |
| Hydrogen Sulphide | HNO2 |
| Ammonia | H3BO3 |
| Phosphine | H3PO4 |
| Methane | H2SO4 |

**12. Write the basic and acidic radicals of the following and then write the chemical formulae of these compounds**.

a) Barium sulphate

b) Bismuth nitrate

c) calcium bromide

d) Ferrous sulphide

e) Chromium sulphate

f) Calcium silicate

g) Stannic oxide

h) Sodium Zincate

i) Magnesium phosphate

j) Sodium thiosulphate

k) Stannic phosphate

l) Nickel-bi-silphate

m) Potassium mangnate

n) Potassium ferrocynide

**13. Write chemical names of the following compounds:**

a) Ca3(PO4)2

b) K2CO3

c) K2MnO4

d) Mn3(BO3)2

e) Mg(HCO3)2

f) Na4Fe(CN)6

g) Ba(Cl3)2

h) Ag2SO3

i) (CH3COO)2Pb

j) Na2SiO3

**14. Give the names of the elements and number of atoms of those elements, present in the following compounds.**

a) Sodium sulphate

b) Quick lime

c) Baking soda (NaHCO3)

d) Ammonia

e) Ammonium dichromate

15. What is a chemical equation? Why it is necessary to balance it.

16. State the information conveyed by the following equation.

Zn(s) + 2HCl(aq) → ZnCl2(aq) + H2

17. Write the limitation of chemical reacton.

**18. Write chemical equations for the following equations and balance them.**

a) Carbon + Oxygen → Carbon-di-oxide

b) Nitrogen + Oxygen → Nitrogen monoxide

c) Calcium + Nitrogen → Calcium nitride

d) Calcium oxide + carbon dioxide → Calcium carbonate

e) Magnesium + Sulphuric acid → Magnesium sulphate + Hydrogen

**19. Balance the following equations**

a) Fe + H2O → Fe3O4 + H2

b) Ca + N2 → Ca3N2

c) Zn + KOH → K2ZnO2 + H2

d) Fe2O3 + CO → Fe + CO2

e) PbO + NH3 → Pb + H2O + N2

f) Pb3O4 → PbO + O2

g) PbS + O2 → PbO + SO2

h) S + H2SO4 → SO2+ H2O

i) S + HNO3 → H2SO4 + NO2 + H2O

j) MnO2 + HCl → MnCl2 + H2O + Cl2

k) C + H2SO4 → CO2 + H2O + SO2

l) KOH + Cl2→ KCl + KClO + H2O

m) NO2 + H2O → HNO2 + HNO3

n) Pb3O4 + HCl → PbCl2 + H2O + Cl2

o) H2O + Cl2 → HCl + O2

p) NaHCO3 → Na2CO3 + H2O + CO2

q) HNO3 + H2S → NO2 + H2O + S

r) P + HNO3 → NO2 + H2O + H3PO4

s) Zn + HNO3 → Zn(NO3)2+ H2O + NO2

20. Sodium chloride reacts with silver nitrate to produce silver chloride and sodium nitrate

a) Write the equation

b) Check whether it is balanced, if not balance it.

c) Find the weights of reactants and products.

d) State the law that this equation satisfies?

21. What information does the following chemical equations convey?

a) Zn + H2SO4 → ZnSO4 + H2

b) Mg + 2HCl → MgCl2 + H2

**22. Write the balanced chemical equations of the following word equations**

a) Sodium hydroxide + Sulphuric acid → Sodium Sulphate + Water

b) Potassium bicarbonate + Sulphuric acid → Potassium Sulphate + Carbon di oxide + Water

c) Iron + Sulphuric acid → Ferrous sulphate + Hydrogen

d) Chlorine + Sulphur di oxide + Water → Sulphuric acid + Hydrogen Chloride

e) Silver Nitrate → Silver + Nitrogen di oxide + Oxygen

f) Copper + Nitric acid → Copper nitrate + Nitric oxide + water

g) Ammonia + Oxygen → Nitric oxide + Water

h) Barium chloride + Sulphuric acid → Barium Sulphate + Hydrochloric acid

i) Zinc sulphide + Oxygen → Zinc oxide + Sulphur dioxide

j) Aluminium carbide + Water → Aluminium hydroxide + methane

k) Iron Pyrites + Oxygen → Ferric oxide + Sulphur di oxide

l) Potassium permanganate + Hydrochloric acid → Potassium chloride + Manganese chloride + chlorine + Water

m) Aluminium sulphate + Sodium hydroxide → Sodium sulphate + Sodium meta aluminate + Water

n) Aluminium + Sodium hydroxide + Water → Sodium meta aluminate + Hydrogen

o) Potassium dichromate + Sulphuric acid → Potassium sulphate + Chromium sulphate + Water + Oxygen

p) Potassium dichromate + Hydrochloric acid → Potassium chloride + Chromium chloride+ Water + Chlorine

q) Sulphur + Nitric acid → Sulphuric acid + Nitrogen dioxide + Water

r) Sodium chloride + Manganese dioxide + Sulphuric acid → Sodium hydrogen sulphate + Manganese sulphate + Water+ Chlorine

23. a) Define atomic mass unit

b) Calculate the molecular mass of the following

i) Na2SO4.10H2O ii) (NH4)2CO3  iii) (NH2)2CO iv) Mg3N2

Give atomic mass of Na = 23, H = 1, O = 16, C = 12, N = 14, Mg = 24, S = 32

**24. Calculate the relative molecular masses of:**

(a) CHCI3

(b) (NH4)2Cr2O7

(c) CuSO4.5H2O

(d) (NH4)2SO4

(e) CH3COONa

(f) Potassium chlorate

(g) Ammonium chloroplatinate (NH4)2PtCl6

[At. mass: C = 12,H = 1, O = 16, Cl = 35.5, N = 14, Cu = 63.5, S = 32, Na = 23, K = 39, Pt = 195, Ca = 40, P = 31, Mg = 24]

**25. Give the empirical formula of:**

(a) Benzene (C6H6) (b) Glucose (C6H12O6) (c) Acetylene (C2H2) (d) Acetic acid (CH3COOH)

26. Find the percentage mass of water in Epsom salt MgSO4.7H2O.

27. Calculate the percentage of phosphorus in:

(a) Calcium hydrogen phosphate Ca(H2PO4)2

(b) Calcium phosphate Ca3(PO4)2

28. Calculate the percentage composition of each element in Potassium chlorate, KClO3.

29. Urea is a very important nitrogenous fertilizer. Its formula is CH4N2O. Calculate the percentage of carbon in urea. (C = 12, O = 16, N = 14 and H = 1)

**Lesson 2: Chemical changes and reactions**

**1. (a) What is a chemical reaction?**

**(b) State the conditions necessary for a chemical change or reaction.**

**2. Define the following terms**

**(a) Chemical change**

**(b) Chemical bond**

**(c) Effervescence**

**(d) Precipitate**

**3. Define :**

**(a) Photochemical reaction (b) Electrochemical reaction. Give one example in each case.**

**4. Give a reason for the following :**

**a) Silver nitrate solution is kept in coloured bottles.**

**(b) Molybdenum is used in the manufacture of ammonia.**

**(c) A blue solution of copper sulphate changes to green when a piece of iron is added to this solution.**

**(d) Colourless concentrated sulphuric acid in a test tube changes to blue on adding a small piece of copper to it.**

**5. Explain, giving one example for each of the following chemical changes:**

**(a) Double decomposition (b) Thermal dissociation**

**(c) Reversible reaction (d) Displacement**

**6. (a) Define neutralization reaction with an example.**

**(b) Give a balanced equation for this reaction.**

**(c) Give three applications of neutralization reactions.**

**7. (a) What is a decomposition reaction ?**

**(b) Decomposition reactions can occur by (i) heat (ii) electricity and (iii) sunlight.**

**Give two balanced reactions for each.**

**8. State the type of reactions each of the following represent and balance the ones that are not balanced.**

**(a) Cl, + 2KBr → 2KC1 + Br,**

**(b) NaOH + HCI NaCl + H2O**

**(c) 2Hg0 –) 2Hg + 02**

**(d) Fe + CuSO4 FeSO4 + Cu**

**(e) PbO2 +SO2 PbSO4**

**(f) 2KClO3→ 2KCl + 3O2**

**(g) 2H2O2→ 2H2O + O2**

**(h) KNO3 + H2SO4→ HNO3 + KHSO4**

**(i) CuO+H2→ Cu+ H2O**

**(j) CaCO3→ CaO+ CO2**

**(k) NH4Cl → NH3 + HCl**

**(l) PbO + 2HNO3→ Pb(NO3) + 2H2O**

**(m) AgNO3 + NaCl → AgCl + NaNO3**

9. What is a chemical change? Give two examples of a chemical change?

10. Why energy is involved in a chemical change?

11. What do you understand by ‘chemical reaction’?

12. Give an example of a reaction where the following are involved

(a) Evolution of heat

(b) Absorption of heat

(c) High pressure is required

13. State the main characteristics of chemical reactions. Give at least one example in each case

14. Define exothermic and endothermic changes. Give two examples in each case.

**15. Define:**

(a) Photochemical reaction

(b) Electrochemical reaction

Give one example in each case

**16. Complete and balance the following reactions:**

(a) NaCl(aq) + AgNO3(aq) →

(b) Pb(NO3)2 + KI →

(c) CuCO3→△

(d) Pb(NO3)2 →△

(e) NH3 + O2 →pt

**17. What do you observe? When**

a) Lead nitrate is heated.

b) Silver chloride is exposed to sunlight.

c) Hydrogen peroxide is exposed to sunlight.

d) H2S gas is passed through copper sulphate solution.

e) Barium chloride is added to sodium sulphate solution

f) Water is added to the quick lime.

g) Sodium chloride solution is added to silver nitrate solution.

**18. Name:**

(a) a carbonate which does not decompose on heating.

(b) a nitrate which produces oxygen as the only gas.

(c) a compound which produces carbon dioxide on heating

(d) a nitrate which produces brown gas on heating.

**Lesson 3: Water**

1. Water exists in all the three states. Discuss

2. Why water is considered a compound.

3. a) Why does temperature in Mumbai and Chennai not fall as low as it does in Delhi.

b) Give the properties of water responsible for controlling the temperature of our body.

4. ‘Water is a universal solvent’ comment

5. How do fishes and aquatic animals survive when the pond gets covered with thick ice?

6. How is aquatic life benefitted by the fact that water has a maximum density at 4°C?

7. What are your observations and conclusion when tap water is boiled and evaporated in watch glass?

8. What is the importance of dissolved salts in the water?.

9. What is the importance of dissolved air in water?

10. Explain why:

(a) Boiled or distilled water tastes flat.

(b) Ice at zero degree centigrade has a greater cooling effect than water at 0°C.

(c) Burns caused by steam are more severe than burns caused by boiling water.

(d) Rivers and lakes do not freeze easily?

(e) Air dissolved in water contains a higher proportion of oxygen.

(f) If distilled water is kept in a sealed bottle for a long time, it leaves etchings on the surface of the glass.

(g) Rainwater does not leave behind concentric rings when boiled.

11. Explain the terms

a) Solution b) solute c) solvent

12. Explain why the hot saturated solution of potassium nitrate forms crystals as it cools.

13. a) If you are given some copper sulphate crystals, how would you proceed to prepare its saturated solution at room temperature?

b) How can you show that your solution is really saturated?

14. a) Define

i) Henry’s law ii) Crystallization iii) Seeding (iv) State any three methods of crystallization.

15. What would you observe when crystals of Copper(II) sulphate are heated in a test-tube strongly.

16. Give the names and formulae of two substances in each case

a) Hydrated substance b) anhydrous substance

c) liquid drying agent d) a basic drying agent

17. State the term : (Do not give examples)

(a) A solution where the solvent is a liquid other than water.

(b) When a substance absorbs moisture on exposure to moist air and dissolves in the absorbed water and turned to the solution.

(c) A substance which contains water of crystallisation.

(d) When a substance absorbs moisture from the atmosphere but does not form a solution.

(e) When a compound loses its water of crystallisation on exposure to dry air.

(f) The substance that can remove hydrogen and oxygen atoms in the ratio of 2 : 1 (in the form of water) from the compounds.

18. Explain why :

a) water is an excellent liquid to use in cooling systems.

b) a solution is always clear and transparent.

(c) lakes and rivers do not suddenly freeze in the winters.

(d) the solute cannot be separated from a solution by filtration.

(e) Fused CaCl2 or conc. H2SO4 is used in a desiccator.

(f) effervescence is seen on opening a bottle of soda water.

(g) Table salt becomes sticky on exposure to humid air during the rainy season.

19. What are drying or desiccating agents. Give examples.

20. What are hydrous substances? Explain with examples.

21. Name the three methods by which hydrous substances can be made anhydrous..

22. State two ways, by which a saturated solution can be changed to an unsaturated solution.

23. What do you understand by

(a) Soft water

(b) Hard water

(c) Temporary Hard water

(d) Permanent hard water.

24. What are the causes for

(a) Temporary hardness (b) Permanent hardness

25. What are the advantages of (i) soft water (ii) Hard water

26. What are stalagmites and stalactites`’ How are they formed?

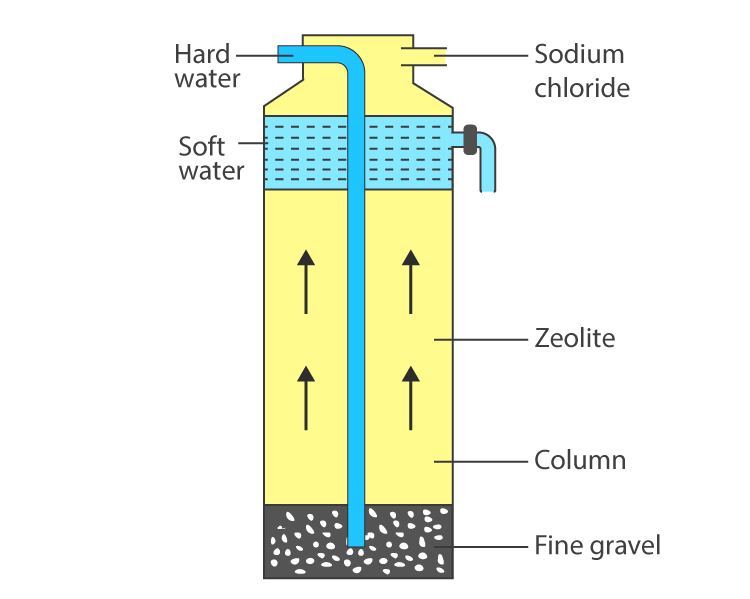
27. Name the substances which give water (i) temporary hardness (ii) permanent hardness.

28. State the disadvantages of using hard water.

29. Explain with the equation. what is noticed when permanent hard water is treated with

(a) slaked lime (b) washing soda

30. What is permutit method, how can it be used for softening hard water?



**Lesson 8: Atmospheric pollution**

**1. Define the following terms**

(i) pollution (ii) pollutant (iii) air pollution.

2. Name any four gaseous pollutants.

3. Name the compounds of sulphur that cause air pollution. Also, state the harmful effects of sulphur compounds.

**4. State**

i) natural sources of air pollution

ii) man-made sources of air pollution

5.a)How do the oxides of nitrogen enter the atmosphere?

b) What are their harmful effects?

6. State the origin and health impact of smog.

7. What are the harmful effects of oxides of Sulphur?

8. State the main sources and effects of carbon monoxide.

9. Give the mechanism of the action of carbon monoxide.

10. How can we control carbon monoxide poisoning?

11. What are the causes of acid rain?

**12. Give the impact of acid rain:**

1. on plants 2. on soil 3. on water bodies

13. What do you understand by the Green House effect?

14. What are greenhouse gases? How are they responsible for global warming?

**15. State the sources and effects of the following gases:**

1. Carbon dioxide 2. Methane 3. Water vapour

16. State the ways of reducing the presence of greenhouse gases.

17. State the effects of greenhouse gases on the atmosphere.

18. How can we reduce global warming?

19. What is air pollution? How does this pollution take place?

20. Name some particulate pollutants.

21. Why is cigarette-smoking harmful?

22. What is smog? State its damaging effects.

23. What do you understand by ppm?

24. What is the function of ozone in the atmosphere?

25. State the chemicals responsible for ozone layer destruction.

**26. Name any two:**

a. Natural sources of atmospheric pollution.

b. Gases which are responsible for the formation of acid rain.

27. Explain the term ‘global warming’. State two ways by which global warming can be reduced.

28. State two effects of ozone depletion.

29. What is the cause of acid rain? Give any two impacts of acid rain.

30. State an advantage of CNG (Compressed Natural Gas).