Chemistry Practical Class 9 To carry out the reaction of Heating of copper sulphate crystals and classify it as physical or chemical changes Viva Questions with Answers

Q1. Define Physical Changes.

Answer. A physical change occurs when there is no change in the composition of a substance and no change in the chemical nature of the substance.
The interconversion of state occurs during physical change.

SOLID ⇄ LIQUID ⇄ GAS

Q2. Define Chemical Changes.

Answer. It is a change that causes a change in the chemical properties of matter, resulting in the formation of a new substance. As an example, consider the burning of oil or fuel.
Heat is evolved or taken in, the formation of bubbles, gas, and fumes, as well as a change in the colour of the reactants, can take place when they form a product.

Reactants → Products
A + B → C (Chemical reaction)

Q3. What is a Chemical Reaction?

Answer. A chemical reaction is a chemical change in which the bonds are broken within reactant molecules, and new bonds are formed within product molecules in order to form a new substance. A chemical reaction can be represented by a chemical equation, which specifies the number and type of atoms involved, as well as their arrangement into molecules or ions. The element symbols are used as shorthand notation for the elements in a chemical equation, with arrows indicating the direction of the reaction.

Q4 How many types of chemical reactions are there?

Answer. There are 4 types of chemical reactions. They are as follows-

- Combination Reaction
- Decomposition Reaction
- Displacement Reaction
- Double Displacement Reaction

Q5. Define Combination reaction.

Answer. A reaction in which two or more reactants combine to form a single product is known as a combination reaction. It takes the form of X + Y → XY
Combination reaction is also known as a synthesis reaction.
Example of combination reaction: $2Na + Cl_2 \rightarrow 2NaCl$

Q6. Define Decomposition Reaction.

Answer. A reaction in which a single compound breaks into two or more simpler compounds is known as a decomposition reaction.
It takes the form of XY → X + Y
A decomposition reaction is just the opposite of a combination reaction.
Example of a decomposition reaction: $CaCO_3 \rightarrow CaO + CO_2$

Q7. Define Displacement Reaction.

Answer. A chemical reaction in which a more reactive element displaces a less reactive element from its aqueous salt solution. It takes the form X + YZ → XZ + Y
It is also called a substitution reaction
Example of displacement reaction: $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$

Q8. Define Double Displacement Reaction.

Answer. A chemical reaction in which ions get exchanged between two reactants which form a new compound is called a double displacement reaction. It takes the form of XY + ZA → XZ + YA
It is also called a metathesis reaction
Example of a double displacement reaction:
$BaCl_2 + Na_2SO_4 \rightarrow BaSO_4 + 2NaCl$

Q9. State the procedure for heating copper sulphate crystals.

Answer. Stepwise procedures for heating copper sulphate crystals are as follows-

- Take a small amount of copper sulphate crystals in a dry boiling test tube.
- Hold the boiling test tube with a test tube holder and it will be heated over the flame on a bunsen burner.
- The changes are observed after heating some time.

Q10. What is the formula of copper sulphate crystals?

Answer. The formula of copper sulphate crystals is $CuSO_4.5H_2O$.

Q11. What is the chemical name of $CuSO_4.5H_2O$?

Answer. The chemical name of copper sulphate crystals is copper sulphate pentahydrate.

Q12. What is the formula of copper sulphate solution?

Answer. The formula of copper sulphate solution is $CuSO_4$.

Q13. What is the colour of copper sulphate?

Answer. The colour of copper sulphate is blue.

Q14. In the formula of copper sulphate crystals, what does $5H_2O$ means?

Answer. In the formula of copper sulphate crystals, $5H_2O$ means it contains five moles of water of crystallisation. It is because of water of crystallization, that the colour of the copper sulphate pentahydrate is blue.

Q15. What was your observation on heating copper sulphate crystals?

Answer. Water vapour escapes and condenses near the test tube's mouth. The crystal's blue colour fades and turns into a white powder.

Q16. What will you observe when water is added to the white powder?

Answer. When water is added to the white powder it will turn blue.

Q17. Why did the white powder turn blue?

Answer. White powder turns blue because it becomes hydrated again.

Q18. State the result of the experiment.

Answer. On gentle heating, the hydrated copper sulphate loses water of crystallisation and turns dirty white. When heated further, it decomposes into black copper oxide and pungent-smelling sulphur trioxide.

Q19. State some precautions that need to be followed while performing the experiment.
Answer. Some precautions that need to be followed while performing the experiment are as follows-

- Copper sulphate is a highly toxic substance. It is not to be touched or tasted.
- Sulphuric acid is formed when sulphur trioxide reacts with atmospheric moisture. As a result, contact with sulphur trioxide should be avoided.
- Copper sulphate should be gently heated at the start of the experiment. However, after the formation of anhydrous copper sulphate, the test tube should be strongly heated.

Q20. Is the reaction a chemical change or a physical change?

Answer. The reaction is a chemical change because new products are formed.

Q21. What type of reaction is it?

Answer. The reaction is reversible in nature.

Q22. What change in colour is observed when copper sulphate is heated?

Answer. When Copper sulfate is heated strongly, it changes into white coloured anhydrous copper sulphate. Later, when water is added again to it then again the colour of copper sulphate is changed to blue.