

Chemistry Practical Class 11 Crystallization Involving Impure Sample of Any One of the Following: Alum, Copper Sulphate, Benzoic Acid Viva Questions with Answers

Q1: List various methods of purification of a substance.

Answer:

1. Evaporation
2. Crystallization
3. Decantation
4. Filtration
5. Distillation

Q2: Define the term 'crystallisation'.

Answer:

Crystals are substances that are found in well-defined geometrical shapes. When a hot saturated salt solution is allowed to cool slowly and undisturbed, these are created. This process is called crystallisation.

Q3: What is the formula of benzoic acid?

Answer:

Benzoic acid is a white solid with the formula C_6H_5COOH .

Q4: What happens when the following crystals are heated separately?

(i) Blue vitriol (ii) Potash alum (iii) Benzoic acid

Answer:

- (i) Due to the loss of water during crystallisation, it becomes a white powder.
- (ii) It transforms into a fluffy white mass.
- (iii) It goes through a sublimation process.

Q5: What is the colour of benzoic acid crystals formed?

Answer:

The colour of benzoic acid crystals formed is opaque white colour.

Q6: Name the different steps involved in the process of crystallisation.

Answer:

The various steps are:

- (i) Preparation of the solution.
- (ii) Filtration of the solution.
- (iii) Concentration of the solution.
- (iv) Cooling of the solution slowly.
- (v) Separation and drying of the crystals.

Q7: What are the precautions to be taken during the experiment?

Answer:

- Make sure the crystals are well washed.
- Make sure the solution is not too hot.
- By gently heating the solution, the filtrate should slowly evaporate.
- Cool the solution slowly and do not use any quick cooling techniques.

Q8: Why is the hot saturated solution not cooled suddenly?

Answer:

Crystals expand in size as a saturated solution cools slowly. Rather than providing a massy substance with no correct geometry, it facilitates their better separation as units.

Q9: Why is the solution not heated to dryness to get crystals?

Answer:

Heating the solution to dryness fails to eliminate soluble contaminants, resulting in crystals of poor quality.

Q10: What is filtration?

Answer:

Filtration is the separation of insoluble substances from a solution by passing it through a filter paper.

Q11: Which solvent is used in purification by crystallization of impure CuSO_4 ?

Answer:

Copper sulphate solution can be made by dissolving impure copper sulphate in a small amount of water. After that, it's filtered to get rid of any insoluble contaminants. The copper sulphate solution is now gradually heated over a water bath to evaporate the water and achieve a saturated solution.

Q12: What is meant by the term, 'water of crystallisation'?

Answer:

The number of water molecules present in loose combination with one formula unit of the chemical is referred to as the water of crystallisation.

Q13: How will you obtain crystals of alum from an impure sample?

Answer:

Dissolve the sample in distilled water and filter out the insoluble contaminants to make pure crystals of potash alum. This solution is concentrated and cooled to the point of crystallisation. Colourless transparent crystals of potash alum isolate.

Q14: Explain the term—saturated solution.

Answer:

Saturated solution is a solution in which no additional solute can be dissolved at a given temperature.

Q15: What is Kipp's waste?

Answer:

It's the residue of the reaction between FeS and dilute H_2SO_4 that produces H_2S gas. It mainly consists of FeSO_4 and unreacted dilute H_2SO_4 .

Q16: How can we obtain pure copper sulphate from an impure substance?

Answer:

By re-crystallizing an impure sample, pure copper sulphate can be obtained. The impure sample is dissolved in water, heated, and cooled, resulting in crystal formation. Filtration and drying are used to separate the copper sulphate crystals.

Q17: What is mother liquor?

Answer:

Mother liquor is the liquid left behind after crystals have been separated from a saturated solution.

Q18: What is the term 'seeding'?

Answer:

Crystallisation does not always occur when a saturated solution is cooled. Seeding occurs when a crystal of the same chemical is placed in a saturated solution. It facilitates the rapid removal of crystals from saturated solutions.

Q19: How will you purify an impure sample of benzoic acid?

Answer:

Warm the solution for a few minutes before filtering it with a filtration device. Allow the solution to cool to room temperature before transferring it from the filtration machine to another beaker. Crystals of benzoic acid can be seen forming. Allow benzoic acid crystals to dry after filtering and washing them.

Q20: How do you crystallize benzoic acid?

Answer:

Benzoic acid is a clear, colourless substance. It's extremely soluble in hot water, but not so much in cold water. By dissolving it in hot water, it can be recrystallized. The resulting hot solution is filtered and cooled.