

## Chemistry Practical Class 12 Enthalpy of dissolution of copper sulphate or potassium nitrate Viva Questions with Answers

### Q1. What is the Enthalpy of Copper Sulphate or Potassium Nitrate Dissolution?

**Answer.** The molar heat of a solution, also known as the enthalpy of solution, is defined as the amount of heat taken in or emitted while a mole of a solution is dissolved in any solvent, most commonly water. This molar heat is denoted by  $\Delta H$  and measured in kJ/mol in both popular and academic terms.

### Q2. Which Thermodynamic Law governs the entire experiment?

**Answer.** This experiment follows a well-known thermodynamic law, the law of energy conservation. According to thermodynamics proposed law of conservation of energy, the sum of all enthalpy exchanges must equal zero. As a result, the following equation is used in every heat-related reaction.  
$$\Delta H_1 + \Delta H_2 + \dots + \Delta H_n = 0$$

### Q3. How to Determine the Type of Reaction Based on the Sign of Enthalpy of Copper Sulphate or Potassium Nitrate Dissolution?

**Answer.**  $\Delta H$  is positive if the reaction is exothermic and heat is released during solution formation, and negative if the reaction is endothermic and heat is absorbed.

### Q4. What is the weight of copper sulphate in grams?

**Answer.** Copper sulphate has an equivalent weight of approximately 80 g/mol.

### Q5. What is the enthalpy of dissociation?

**Answer.** The amount of energy required during an endothermic process to break a chemical bond and produce two separated atoms, each with one electron from the first mutual pair, is referred to as the Bond Dissociation Enthalpy.

### Q6. What is meant by the term, calorimeter constant?

**Answer.** A calorimeter constant (abbreviated  $C_{cal}$ ) is a constant that quantifies a calorimeter's heat capacity. It can be calculated by applying a known amount of heat to the calorimeter and measuring the resulting temperature change.

**Q7. Why is  $\Delta_{\text{sol}} H$  for some substances negative while for others it is positive?**

**Answer.** The total amount of heat absorbed or released when two substances combine to form a solution is referred to as the enthalpy of solutions. This sum can be positive or negative.

**Q8. How does  $\Delta_{\text{sol}} H$  vary with temperature?**

**Answer.** When the temperature rises, so does the number of molecular interactions. When the number of interactions increases, so does the system's internal energy.

According to the equation  $H = U + PV$ , as temperature rises, the internal energy (U) increases, and so does the h.

$$C = q/\Delta T$$

**Q9. Will the enthalpy change for dissolution of the same amount of anhydrous copper sulphate and hydrated copper sulphate in the same amount of water be the same or different? Explain.**

**Answer.** No, in the case of anhydrous copper sulphate, the enthalpy change will correspond to both the dissolution and hydration processes, resulting in enthalpy of hydration plus enthalpy of solution.

**Q10. How will the solubility of copper sulphate and potassium nitrate be affected on increasing the temperature?**

**Answer.** Since the dissolution of copper sulphate and potassium nitrate in water is an endothermic process, the solubility of copper sulphate and potassium nitrate in water will increase with increasing temperature.

**Q11. Is the dissolution of hydrated copper sulphate an exothermic or endothermic process?**

**Answer.** The dissolution of hydrated copper sulphate is an Endothermic process.

**Q12. What is the difference between an endothermic and an exothermic reaction?**

**Answer.** Endothermic reactions use chemical reaction bonds to attract and store energy. An exothermic reaction sheds heat energy as it progresses, which means it radiates heat while it is happening.