

Solubility Curve Worksheet

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Part 1: Building a Foundation

What does a solubility curve represent?

Hint: Think about what solubility curves illustrate regarding solutes and temperature.

- A) The melting point of a substance
- B) The boiling point of a substance
- C) The solubility of a substance at various temperatures
- D) The density of a substance at various temperatures

What does a solubility curve represent?

Hint: Consider the definition of a solubility curve.

- A) The melting point of a substance
- B) The boiling point of a substance
- C) The solubility of a substance at various temperatures
- D) The density of a substance at various temperatures

Which of the following are typically shown on the axes of a solubility curve? (Select all that apply)

Hint: Consider the variables that are commonly plotted in scientific graphs.

- A) Temperature
- B) Pressure
- C) Solubility
- D) Volume

Which of the following are typically shown on the axes of a solubility curve? (Select all that apply)

Hint: Think about the variables represented in a solubility curve.

- A) Temperature

- B) Pressure
- C) Solubility
- D) Volume

Explain what is meant by a "saturated solution."

Hint: Think about the maximum amount of solute that can dissolve in a solvent.

Explain what is meant by a "saturated solution."

Hint: Consider the definition and characteristics of saturation.

List two factors that can affect the solubility of a substance.

Hint: Consider both physical and chemical properties.

1. Factor 1

2. Factor 2

What happens to the solubility of most solid solutes as the temperature increases?

Hint: Think about the general trend of solubility with temperature changes.

- A) It decreases

- B) It remains constant
- C) It increases
- D) It fluctuates randomly

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Part 2: Comprehension and Application

Which of the following statements are true about a supersaturated solution? (Select all that apply)

Hint: Consider the characteristics of supersaturated solutions.

- A) It contains more solute than a saturated solution at the same temperature.
- B) It is unstable and can precipitate solute easily.
- C) It is the same as a saturated solution.
- D) It can be formed by cooling a saturated solution slowly.

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Describe how you would identify a saturated solution on a solubility curve.

Hint: Think about the characteristics of the curve and the position of the solution.

Describe how you would identify a saturated solution on a solubility curve.

Hint: Consider the characteristics of a saturated solution in relation to the curve.

If a solubility curve shows that 50 grams of solute can dissolve in 100 grams of water at 60°C, what type of solution is formed if 60 grams of solute are added at the same temperature?

Hint: Think about the definitions of saturated, unsaturated, and supersaturated solutions.

- A) Unsaturated
- B) Saturated
- C) Supersaturated
- D) Dilute

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Hint: Consider the definitions of unsaturated, saturated, and supersaturated solutions.

- A) Unsaturated
- B) Saturated
- C) Supersaturated
- D) Dilute

You have a solution at 40°C with 70 grams of solute per 100 grams of water. The solubility curve indicates that the solubility at 40°C is 60 grams. What actions can you take to make the solution saturated? (Select all that apply)

Hint: Consider the options that would adjust the amount of solute or the conditions of the solution.

- A) Add more solute
- B) Remove some solute
- C) Increase the temperature
- D) Decrease the temperature

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Hint: Consider the options available to adjust the solution's saturation.

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- B) Remove some solute
- C) Increase the temperature
- D) Decrease the temperature

Part 3: Analysis, Evaluation, and Creation

Analyze the following statements and select those that correctly describe the effect of temperature on solubility for gases. (Select all that apply)

Hint: Consider how temperature changes impact gas solubility.

- A) Solubility decreases with increasing temperature.
- B) Solubility increases with increasing temperature.
- C) Solubility is unaffected by temperature changes.
- D) Solubility decreases with decreasing temperature.

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Analyze a given solubility curve and explain how you would determine the temperature at which a solution becomes saturated with 40 grams of solute.

Hint: Think about how to read the curve and find the corresponding temperature.

Analyze a given solubility curve and explain how you would determine the temperature at which a solution becomes saturated with 40 grams of solute.

Hint: Consider the process of reading a solubility curve.

Given a solubility curve, if a point lies above the curve, what does it indicate about the solution?

Hint: Consider the definitions of saturated and supersaturated solutions.

- A) The solution is unsaturated.
- B) The solution is saturated.
- C) The solution is supersaturated.
- D) The solution is at equilibrium.

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- A) The solution is unsaturated.
- B) The solution is saturated.
- C) The solution is supersaturated.
- D) The solution is at equilibrium.

Evaluate the following methods and select those that can be used to create a supersaturated solution. (Select all that apply)

Hint: Think about the processes that can lead to supersaturation.

- A) Rapidly cooling a saturated solution
- B) Slowly cooling a saturated solution
- C) Evaporating some solvent from a saturated solution
- D) Adding more solute to a saturated solution at a higher temperature

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Design an experiment using a solubility curve to determine the effect of temperature on the solubility of a new solute. Describe the steps and expected outcomes.

Hint: Consider the materials and methods you would use in your experiment.

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Hint: Consider the experimental design and what you aim to discover.