# 26 saturated and unsaturated solution pogil key

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Saturated and Unsaturated Solutions\*\*

#### What is a Saturated Solution?

A saturated solution is one in which no more solute (the substance being dissolved) can be dissolved at a given temperature. In other words, the solvent (the liquid doing the dissolving) has reached its maximum capacity for holding the solute.

#### What is an Unsaturated Solution?

In contrast to a saturated solution, an unsaturated solution contains less solute than its solvent can hold at a given temperature. There is still room for more solute to dissolve.

#### How to Tell if a Solution is Saturated or Unsaturated

The features of a graph that can help identify saturated solutions include:

- Constant solute concentration: The graph will show a horizontal line once the solution becomes saturated.
- Excess solute: Any additional solute added to the solution will not dissolve and will appear as a precipitate or solid particles.

#### **Determining if a Liquid is Saturated or Unsaturated**

The liquid that drips from a filter is typically unsaturated because the dissolved particles are too small to be trapped by the filter.

**Key Characteristics of a Saturated Solution** 

• Maximum solute concentration for a given temperature

No more solute can dissolve

Excess solute forms a precipitate

• Equilibrium is reached between dissolved and undissolved solute

**Dissolved Particles in Saturated Solutions** 

When a small amount of additional solute is added to a saturated solution, the number of dissolved particles does not increase. Instead, the excess solute

precipitates out of the solution.

**Pure Substances vs. Solutions** 

A pure substance is a substance that has a fixed composition and consists of only

one type of particle. A solution is a mixture of two or more pure substances.

**Concentrated vs. Dilute Solutions** 

Two ways to differentiate a concentrated solution from a dilute solution are:

• Amount of solute: A concentrated solution has a higher amount of solute

dissolved in it.

• Appearance: A concentrated solution may appear cloudy or opaque due to

the high concentration of solute particles.

Saturated vs. Unsaturated Simple

• Saturated: No more solute can be dissolved.

• Unsaturated: There is still room for more solute to dissolve.

**Examples of Saturated and Unsaturated Solutions** 

• Saturated: Saltwater with all the salt it can hold

• Unsaturated: Sugar water with sugar that can still be dissolved

### **Solubility and Saturated Solutions**

The solubility of a substance depends on the temperature, pressure, and the nature of the substance and solvent.

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