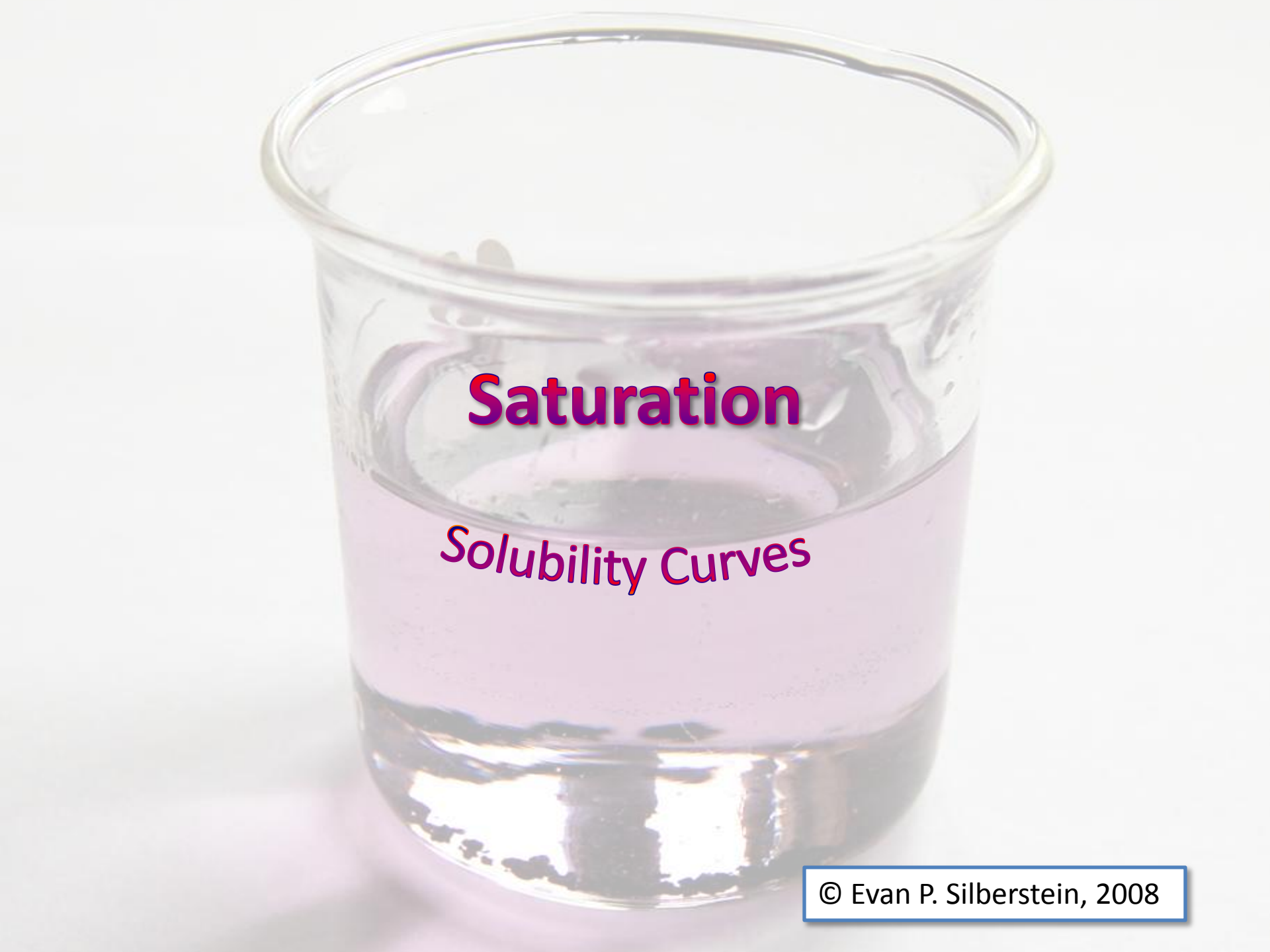
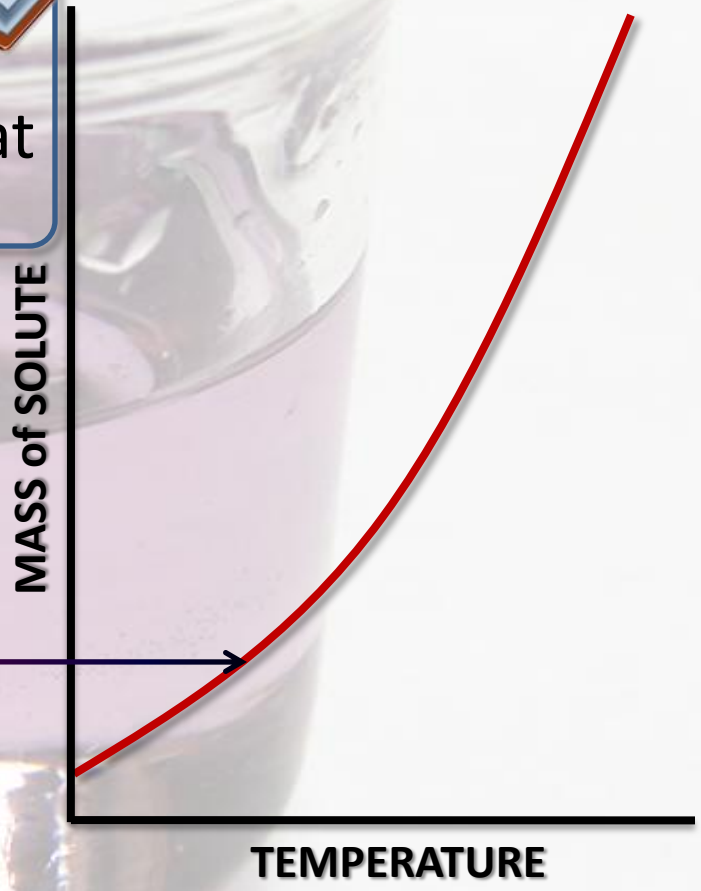


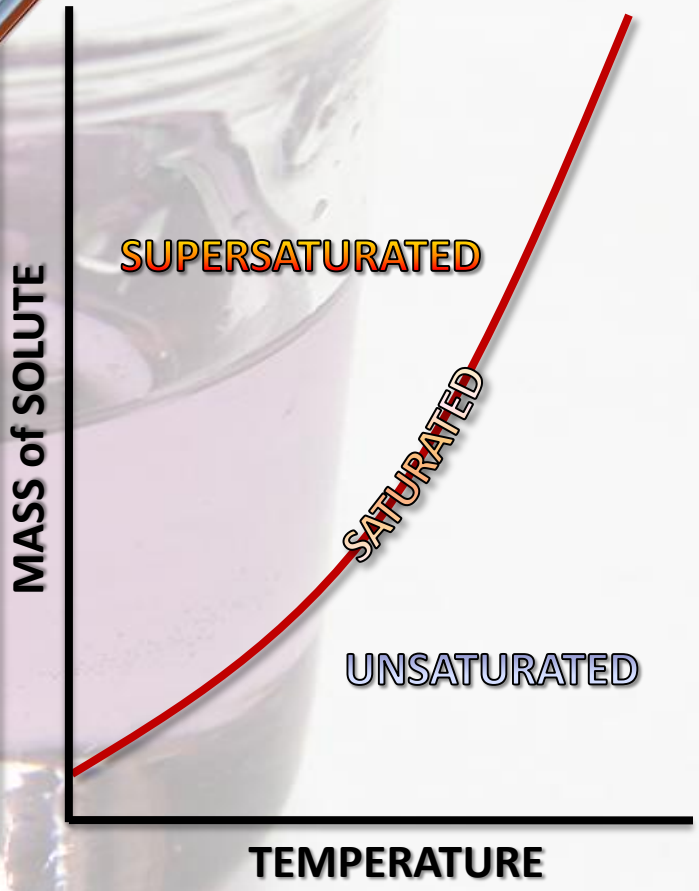
Solubility Curve

- Definition: Solubility curve = graph showing the relationship between the mass of a solute that can dissolve and temperature.
- The solubility curve of a solid shows that as the temperature increases, the mass of solute that can dissolve also increases.
- The *curve* shows the **maximum** amount of solute that can dissolve at a given temperature.



Saturation

- A solution that cannot dissolve any more solute at a given temperature is **saturated**.
- A solution that can dissolve more solute at a given temperature is **unsaturated**.
- A solution that holds more solute than can dissolve at a given temperature is **supersaturated**.



Saturation Test

Add a crystal

- Saturated Solution
  - The crystal falls to the bottom.
- Unsaturated Solution
  - The crystal dissolves.
- Supersaturated Solution
  - Excess solute precipitates.

Interpreting Solubility Curves

- Which compound which is the least soluble at 10°C? **$KClO_3$**
- How many grams of potassium nitrate needed to saturate 100 mL of water at 52°C? **90 g**
- One hundred mL of a potassium chloride solution is saturated at 10°C. How many additional grams are needed to saturate the solution at 50°C? **12 g**
- At what temperature do saturated solutions of sodium chloride and potassium chloride contain the same mass of solute per 100 mL of water? **37°C**
- How many more grams of sulfur dioxide can be dissolved in 100 mL of water at 20°C than at 90°C? **7 g**