**SOLUBILITY OF SOLIDS IN LIQUIDS**

Solubility refers to the maximum amount of a solute that can dissolve in a given amount of solvent at a specific temperature and pressure.

**Factors Affecting Solubility of Solids in Liquids:**

1. **Temperature**
   * For most solids, solubility **increases with temperature** because higher temperatures provide more energy to break intermolecular forces.
   * *Exception:* Some solids (e.g., Ce₂(SO₄)₃) have **decreased solubility** at higher temperatures.
2. **Pressure**
   * Pressure has **negligible effect** on the solubility of solids in liquids because solids and liquids are nearly incompressible.
3. **Surface Area**
   * Increasing surface area (e.g., crushing a solid into powder) **speeds up dissolution** but does **not change solubility** (maximum amount that can dissolve).
4. **Volume of Solvent**
   * More solvent allows more solute to dissolve, but **solubility (concentration per unit volume) remains the same**.

**QUESTION**

The solubility of solid in liquid is increased by (a) decreasing the temperature (b) increasing the pressure (c) increasing the surface area (d) decreasing the volume of solvent

**Answer**

The correct answer is **(a) decreasing the temperature** (assuming the solid follows the general trend where solubility decreases with lower temperature).

However, the question is **poorly framed** because:

* **(b) Increasing pressure** → No effect on solid solubility.
* **(c) Increasing surface area** → Faster dissolution, but no change in solubility.
* **(d) Decreasing solvent volume** → Less solute dissolves, but solubility (per unit volume) stays the same.

**Best Answer: (a) Decreasing temperature** (if the solid's solubility decreases with cooling).

**POSSIBLE JAMB EXAM QUESTIONS & ANSWERS**

**1. Which factor does NOT affect the solubility of a solid in a liquid?**

* (a) Temperature
* (b) Pressure
* (c) Nature of solute and solvent
* (d) Stirring  
  **Answer: (b) Pressure** (has negligible effect).

**2. The solubility of most solids in water increases with:**

* (a) Decreased temperature
* (b) Increased temperature
* (c) Increased pressure
* (d) Decreased surface area  
  **Answer: (b) Increased temperature** (general trend).

**3. Crushing a solid into powder increases its:**

* (a) Solubility
* (b) Rate of dissolution
* (c) Melting point
* (d) Boiling point  
  **Answer: (b) Rate of dissolution** (not solubility).

**4. Which of the following decreases the solubility of a solid in water?**

* (a) Increasing temperature
* (b) Decreasing temperature
* (c) Stirring
* (d) Adding more solvent  
  **Answer: (b) Decreasing temperature** (for most solids).

**5. The solubility of a solid in a liquid depends on:**

* (a) Temperature only
* (b) Nature of solute and solvent
* (c) Pressure and temperature
* (d) Temperature and nature of solute/solvent  
  **Answer: (d) Temperature and nature of solute/solvent** (pressure has little effect).