

NEET/JEE • CHEMISTRY • SOLUTIONS • UNIT 1.3.1

Solid Solubility

JEE Weightage: Low

Like dissolves like — and temperature
isn't always your friend.

Key Vocabulary

Dissolution

Solute dissolves into solvent; concentration increases.

Crystallisation

Solute particles collide and separate out of solution.

Dynamic Equilibrium

Rate of dissolution perfectly matches rate of crystallisation.

Saturated Solution

No more solute can dissolve at the current temperature and pressure.





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$$E=mc^2$$



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Effect of Temperature (Le Chatelier's Principle)

$\Delta_{\text{sol}}H > 0$
(Endothermic)

Solubility  with Temperature

$\Delta_{\text{sol}}H < 0$
(Exothermic)

Solubility  with Temperature

 **JEE Trap Alert: "Heat always increases solubility" is FALSE.**

Master this trap: The direction of the equilibrium shift depends entirely on the sign of the enthalpy of dissolution ($\Delta_{\text{sol}}H$). **Always check if the process is endothermic or exothermic** before assuming a temperature increase will dissolve more solid.

Pressure $\approx$ No Effect (for solids)

Solids and liquids are highly incompressible. Unlike gas solubility (where Henry's Law dictates behavior), changes in atmospheric or applied pressure practically remain unaffected and **barely change the solubility of a solid in a liquid.**

KEY TAKEAWAYS

- **Apply Le Chatelier's Principle** to the dissolution equilibrium to predict shifts.
- **Match the sign of $\Delta_{\text{sol}}H$** to the solubility-temperature trend (Endo = $\uparrow$, Exo = $\downarrow$).
- **Rule out pressure** as a factor for solid solubility due to physical incompressibility.



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