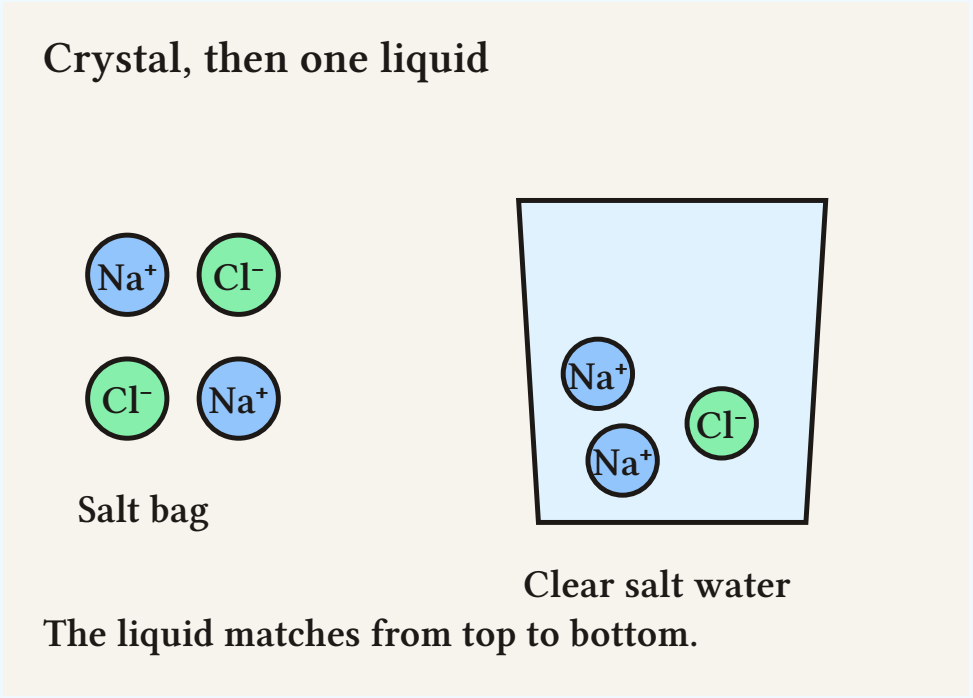
Chemistry 20

Unit C: Solutions and acid-base chemistry

Homogeneous mixtures and dissolving

Solutions and mixtures

- A sealed bag of road salt holds the pure substance sodium chloride, and every crystal has the same ion ratio.
- Salt stirred into water until the solid disappears leaves one clear liquid with matching composition from top to bottom.



Uniform mixing comes before many changes

- Pure substances are elements or compounds, and mixtures are either uniform solutions or samples with visible parts.
- Dissolved ions or molecules can collide, which is why dissolving in water often comes before a chemical change.

Key terms

pure substance

Matter made of one element or one compound, with a fixed composition. (NaCl)

solution

A homogeneous mixture with one visible phase and the same composition in every portion. (salt water)

solute

The substance whose particles spread through the solvent when a solution forms. (NaCl)

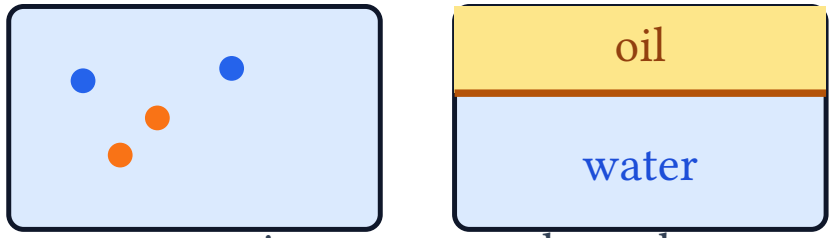
solvent

The substance that does the dissolving and is usually present in the greater amount. (water)

One phase means one particle ratio

- Solute particles spread among solvent particles until every small region has the same ratio.
- Oil over water, or sand under clearer water, keeps a boundary and more than one phase.

One phase vs boundaries



Dissolving spreads solute until uniform

Why the cold pack feels cold

- Pulling solute particles apart and pulling solvent particles apart both absorb energy.
- Attractions that form between solute and solvent release energy, and the larger total sets the temperature change.

Completing the warm-pack tally

- A calcium chloride warm pack warms the skin when the new attractions release more energy than separation absorbs.
- The same comparison of two totals decides any dissolving sample once the energies are given.

Phase and energy sign

- Classify filtered copper sulfate solution and orange juice with pulp by the number of phases.
- Use 55 kJ absorbed and 30 kJ released to state the net energy and the temperature direction.