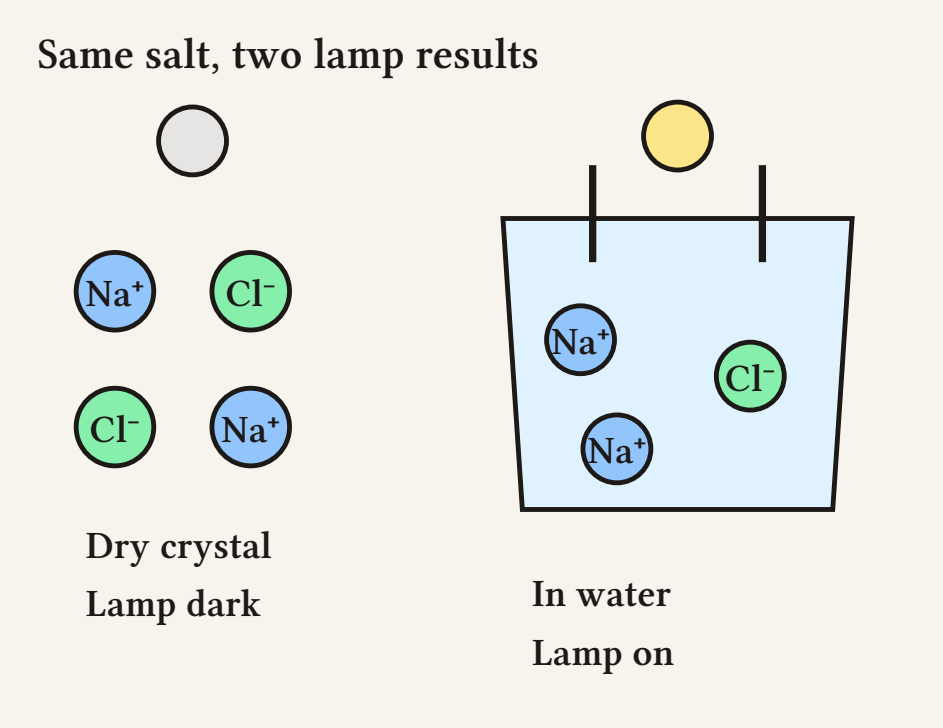
Chemistry 20

Unit A: Matter and chemical bonding

Ionic lattices and their properties

The same crystals, two lamp results

- Dry sodium chloride can sit on a conductivity probe while the lamp stays dark.
- A scoop of those same crystals dissolved in water can close the circuit.



Properties that come from a repeating array

- A grid of ions melts high and lights a lamp only after the ions can move.
- Household cases include table salt, calcium materials in bone and dairy, and baking soda.

Key terms

crystal lattice

A repeating three-dimensional array of positive ions and negative ions. (NaCl array)

melting point

The temperature at which the solid lattice gives way to a liquid, reported here in degrees Celsius. (801 °C)

solubility

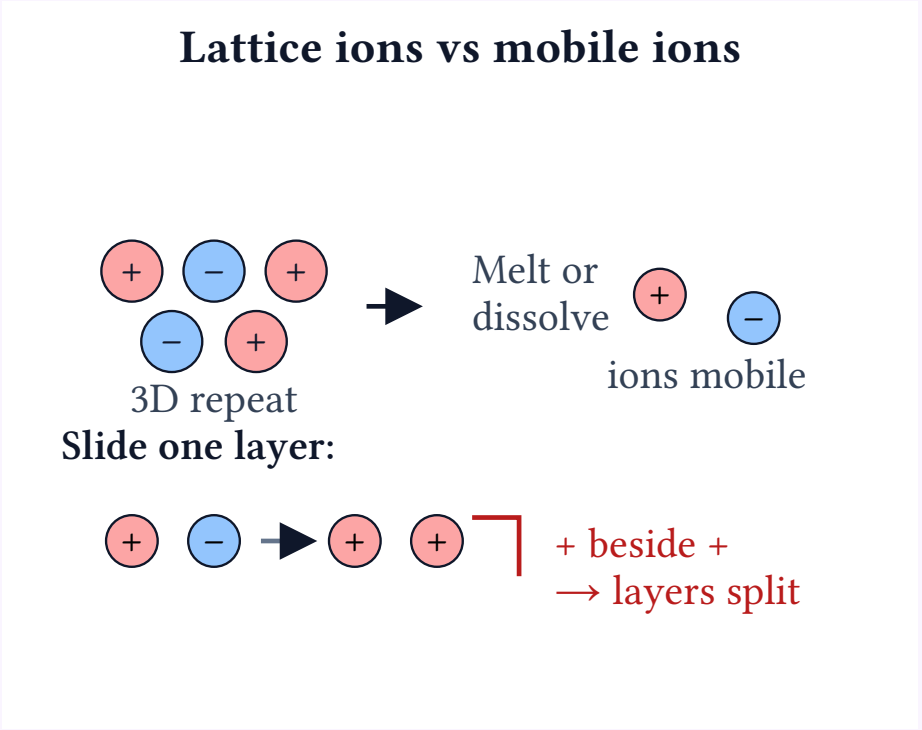
The mass of a solid that dissolves in a stated mass of water at a stated temperature. (36 g in 100 g water)

brittleness

The tendency of an ionic crystal to split when shifted layers bring like charges together. (a tap splits salt)

Fixed ions and free ions

- A lattice is a 3D repeat, and melting or dissolving is what lets ions leave their seats.
- A shifted layer puts positives opposite positives, so the crystal splits apart.



A plan that starts with the label

- The written plan names solubility, the lamp test, and a cited melting point.
- The label is read, and goggles go on, before a scoop is taken.

A two-row lamp table

- Row A is dry sodium chloride and the lamp stays off.
- Row B is 5.0 g of that solid dissolved in 100 mL of distilled water and the lamp lights.

Kitchen lattices

- Name NaCl, calcium materials, and $NaHCO_3$ as ionic arrays people meet outside the lab.
- Match one property of NaCl to the repeating charges.