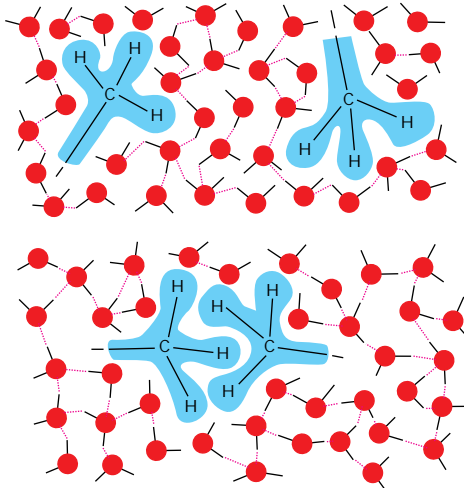


Types of Weak Non-covalent Bonds - Part 2

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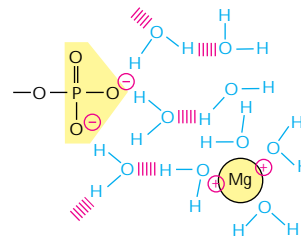
HYDROPHOBIC FORCES



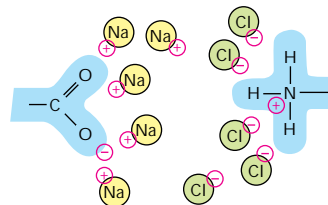
Water forces hydrophobic groups together in order to minimize their disruptive effects on the hydrogen-bonded water network. Hydrophobic groups held together in this way are sometimes said to be held together by "hydrophobic bonds," even though the attraction is actually caused by a repulsion from the water.

IONIC BONDS IN AQUEOUS SOLUTIONS

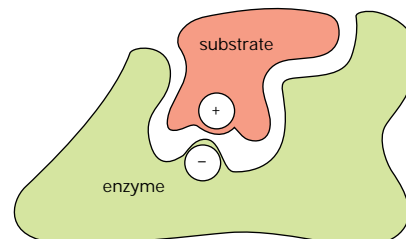
Charged groups are shielded by their interactions with water molecules. Ionic bonds are therefore quite weak in water.



Similarly, other ions in solution can cluster around charged groups and further weaken ionic bonds.



Despite being weakened by water and salt, ionic bonds are very important in biological systems; an enzyme that binds a positively charged substrate will often have a negatively charged amino acid side chain at the appropriate place.



IONIC BONDS

Ionic interactions occur either between fully charged groups (ionic bond) or between partially charged groups.



The force of attraction between the two charges, δ^+ and δ^- , falls off rapidly as the distance between the charges increases.

In the absence of water, ionic forces are very strong. They are responsible for the strength of such minerals as marble and agate.

hand drawn
fig 2.105/2.07



a crystal of
salt, NaCl