Intermolecular Forces

BHS Science Department

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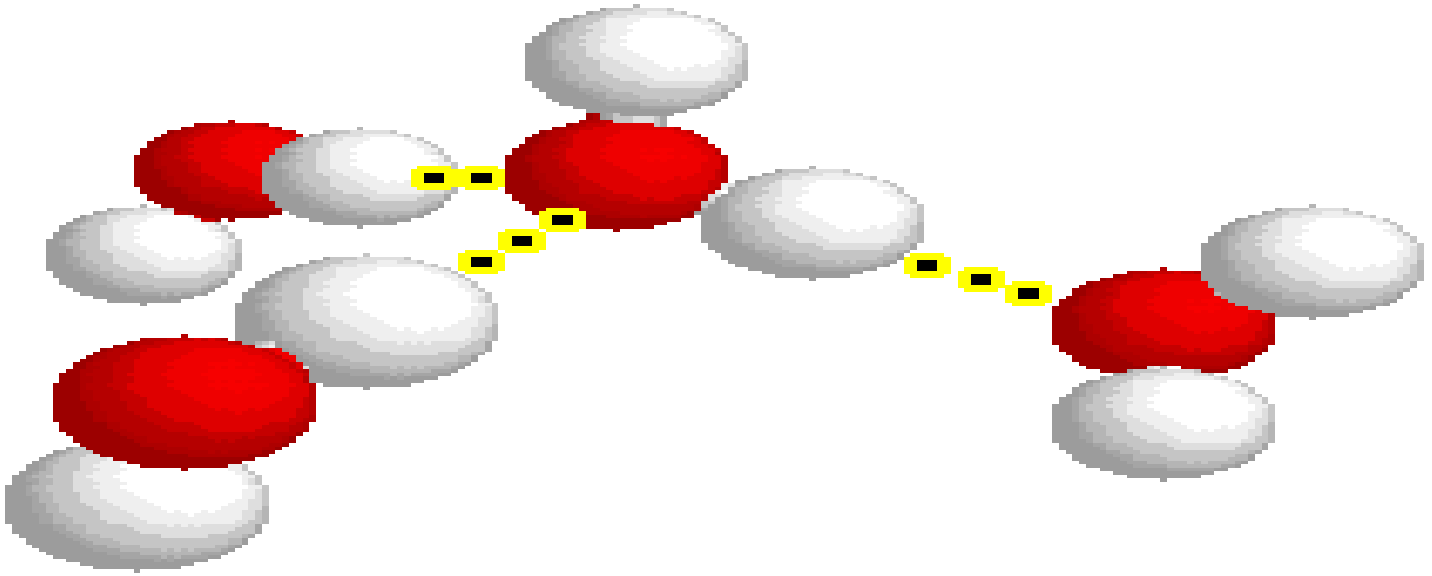
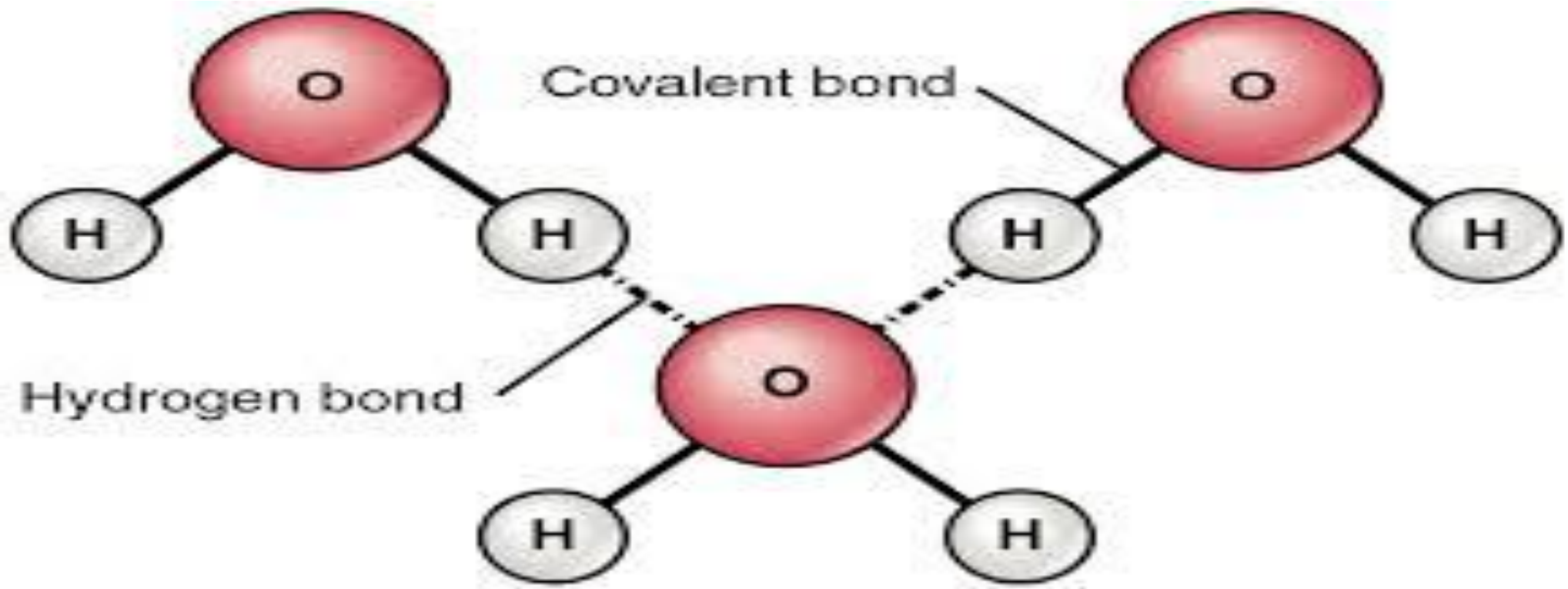
Intermolecular Forces

- In chemistry, there are always interactions between and among atoms and molecules. These attractive forces that holds particle such molecules together are called intermolecular forces.



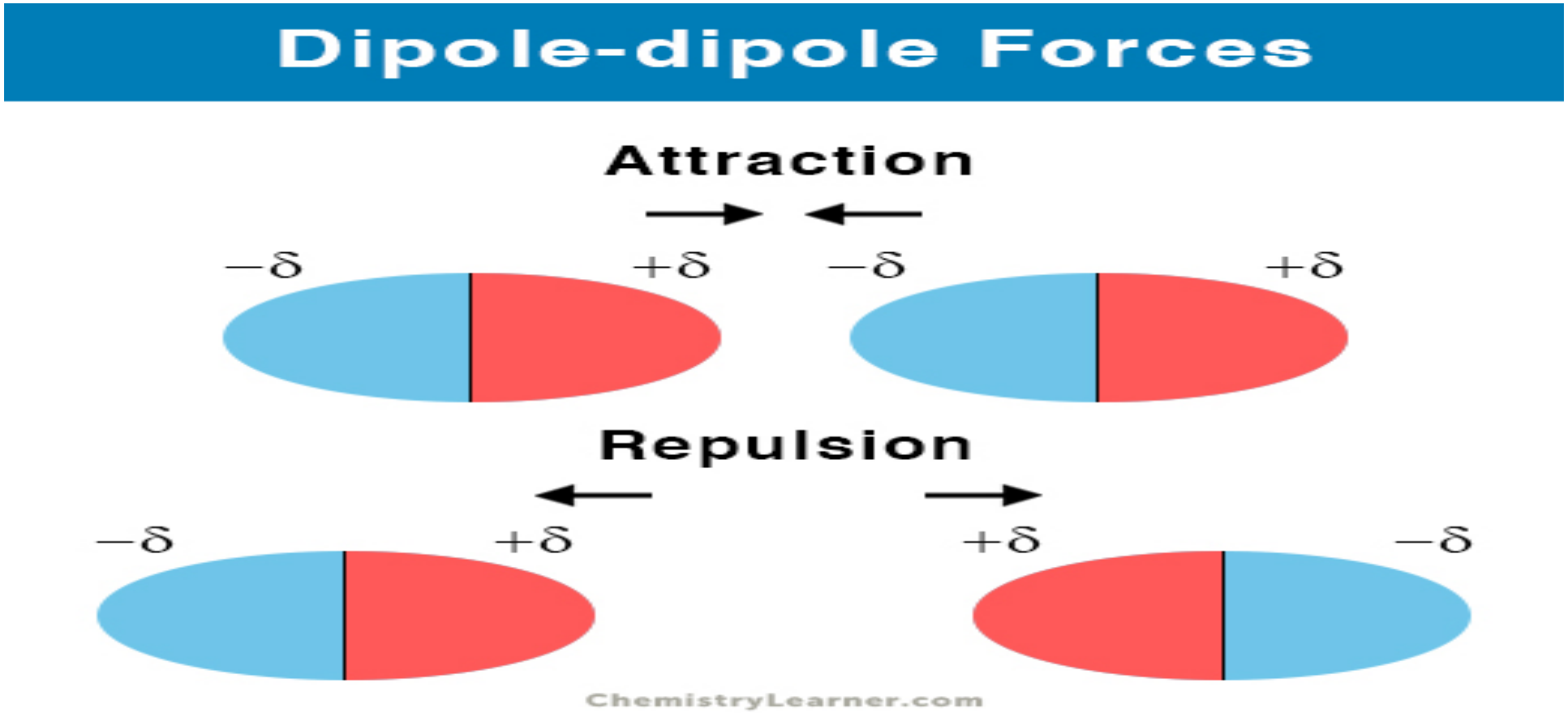
Hydrogen Bond

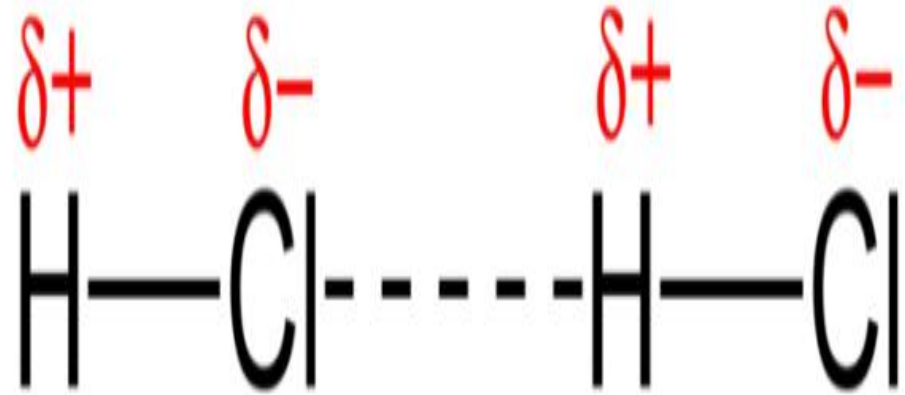
- The hydrogen bond is an attractive force in polar molecules containing hydrogen (H) atom bonded to a strongly electronegative atom such as Fluorine (F), Oxygen (O) and Nitrogen (N).

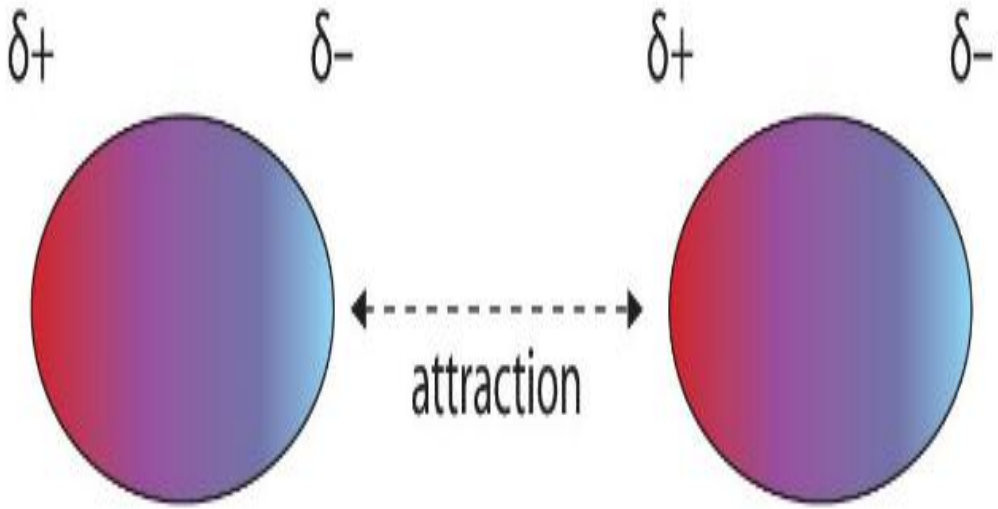


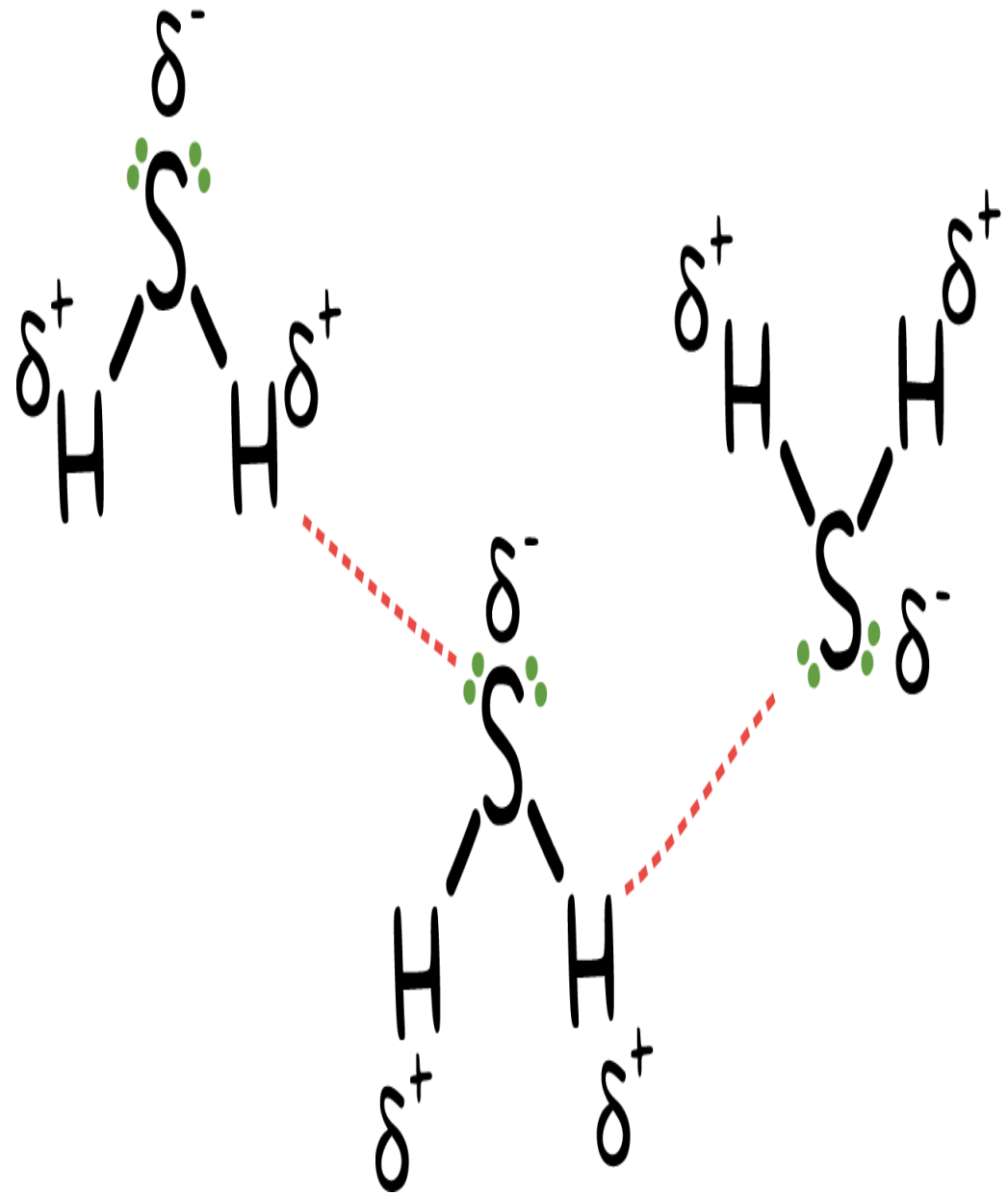
Dipole- Dipole Force

- The dipole-dipole force is an interaction between polar molecules. A dipole is two charges separated by a distance. Therefore, dipole-dipole force is a result of molecules with positive end in one side and negative end on the other side.



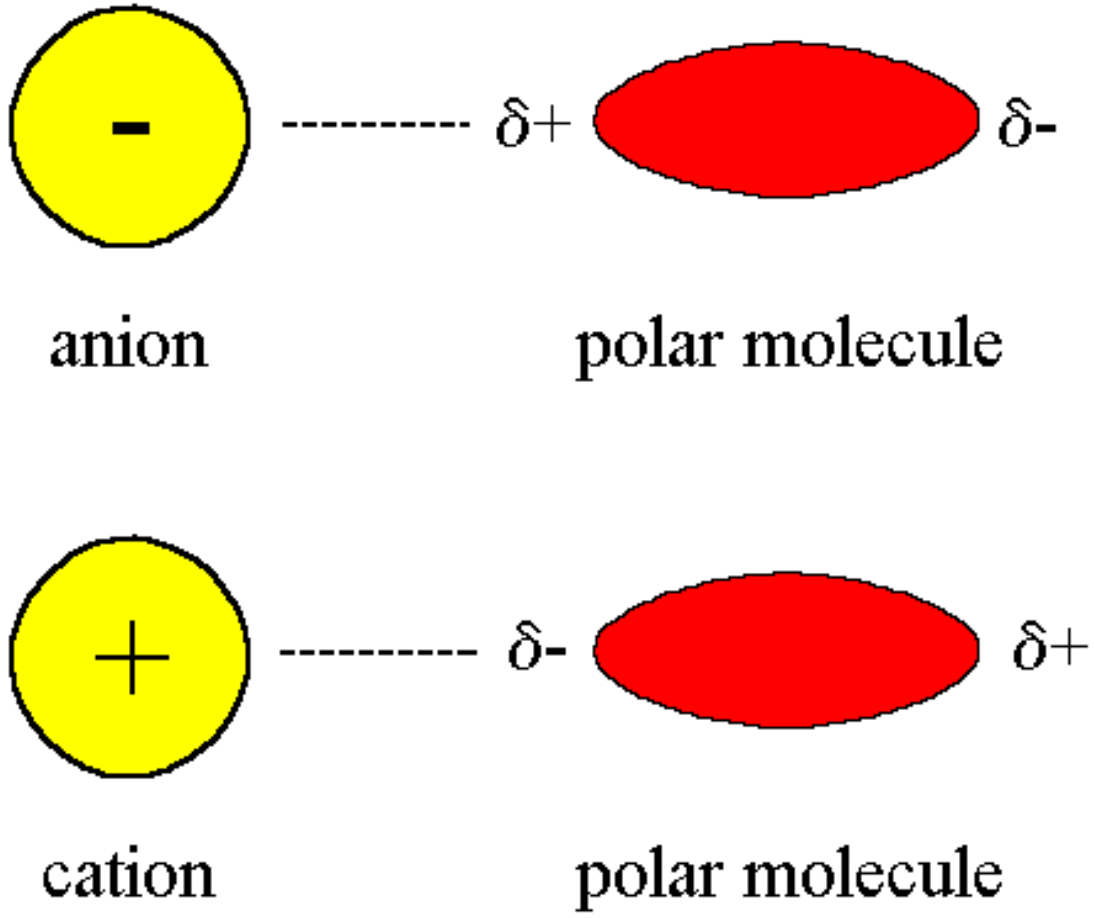

δ+
δ−
δ+
δ−
H—Cl- - - - -H—Cl


δ+
δ−
δ+
δ−
attraction


δ-
δ+
δ+
δ-
δ+
δ+
δ-
δ-
δ+
δ+
δ+
δ+

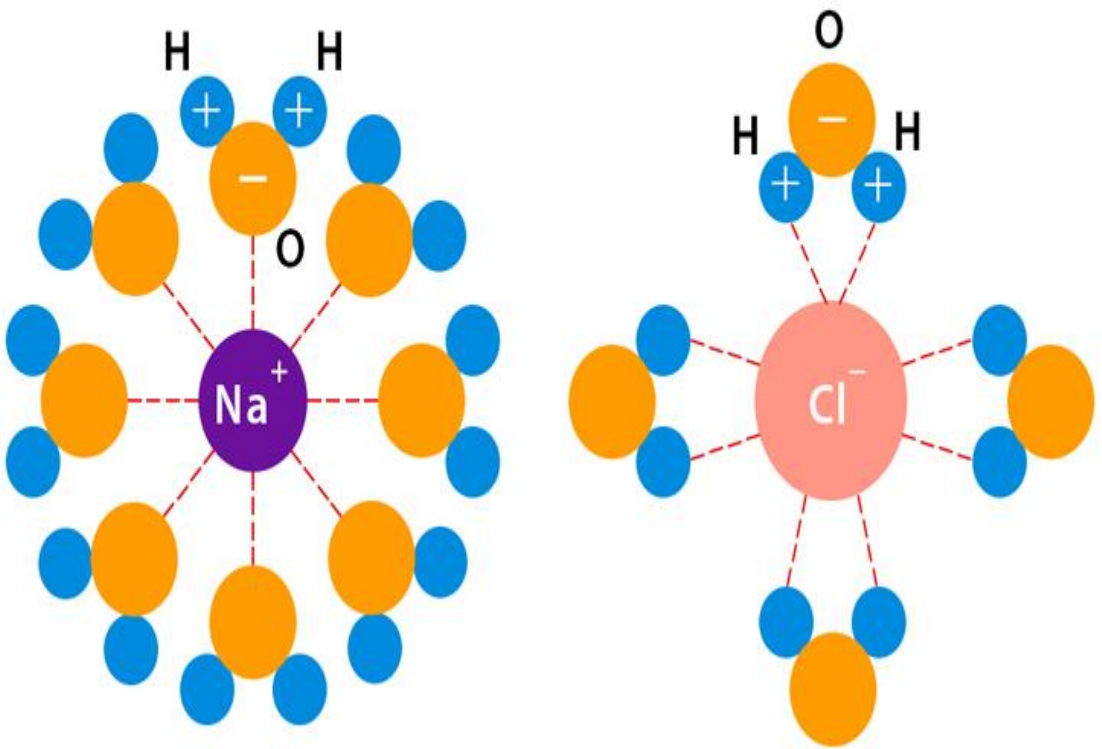
Ion-Dipole Force

- An ion-dipole force is an attractive force between ionic molecules and polar molecules. The cation or the positive ion attracts the negative end of a neutral polar molecule



Ion-dipole Forces Examples

Sodium Chloride (NaCl) Dissolved in Water (H_2O)



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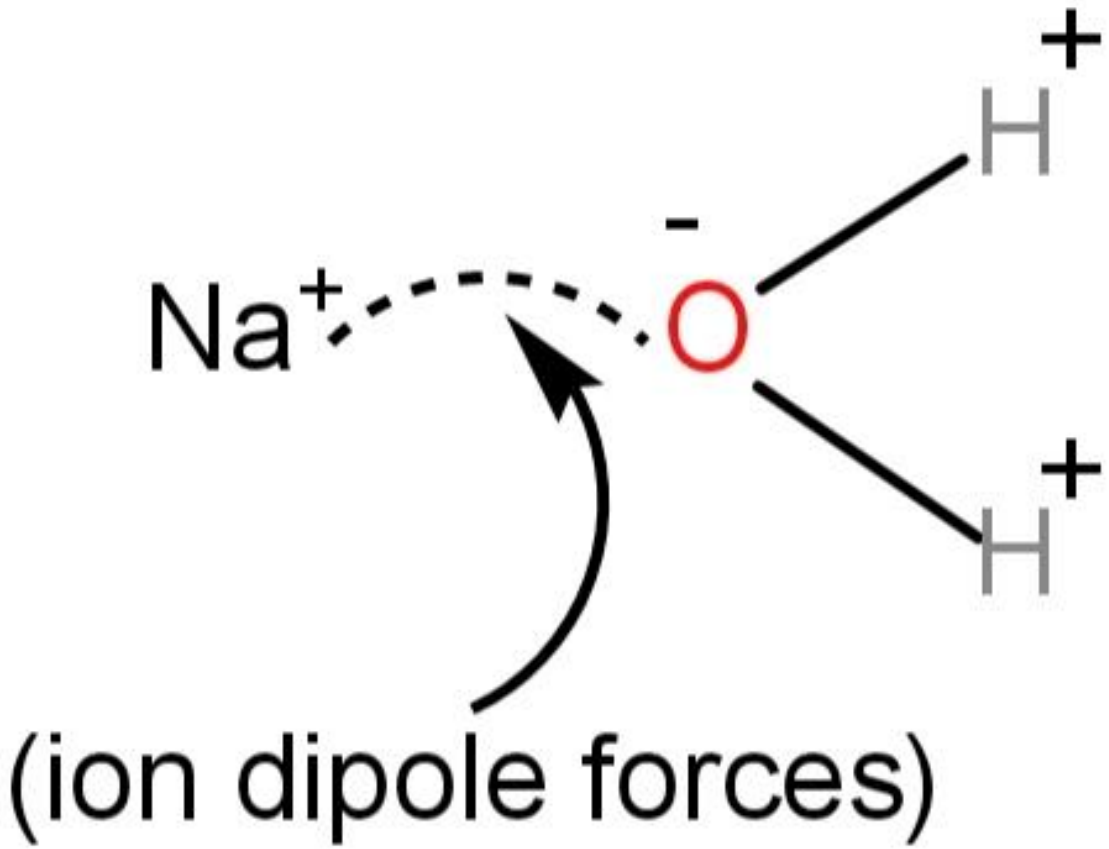
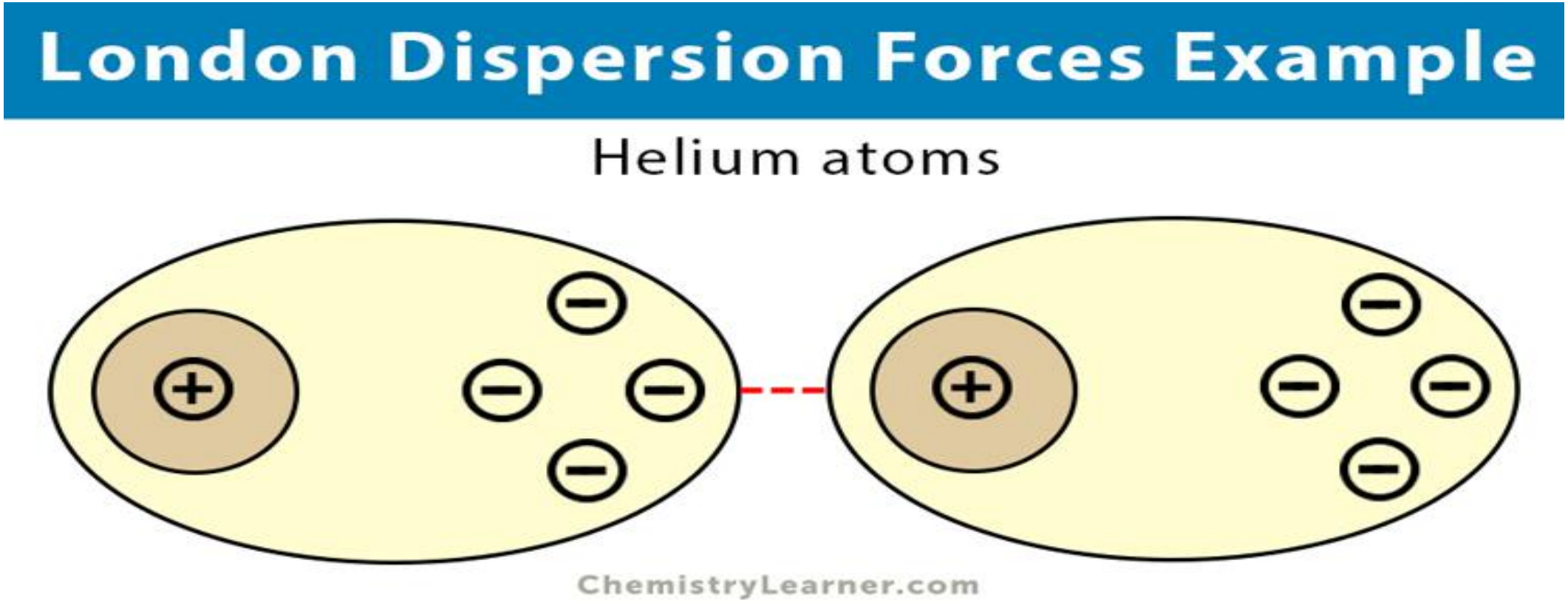
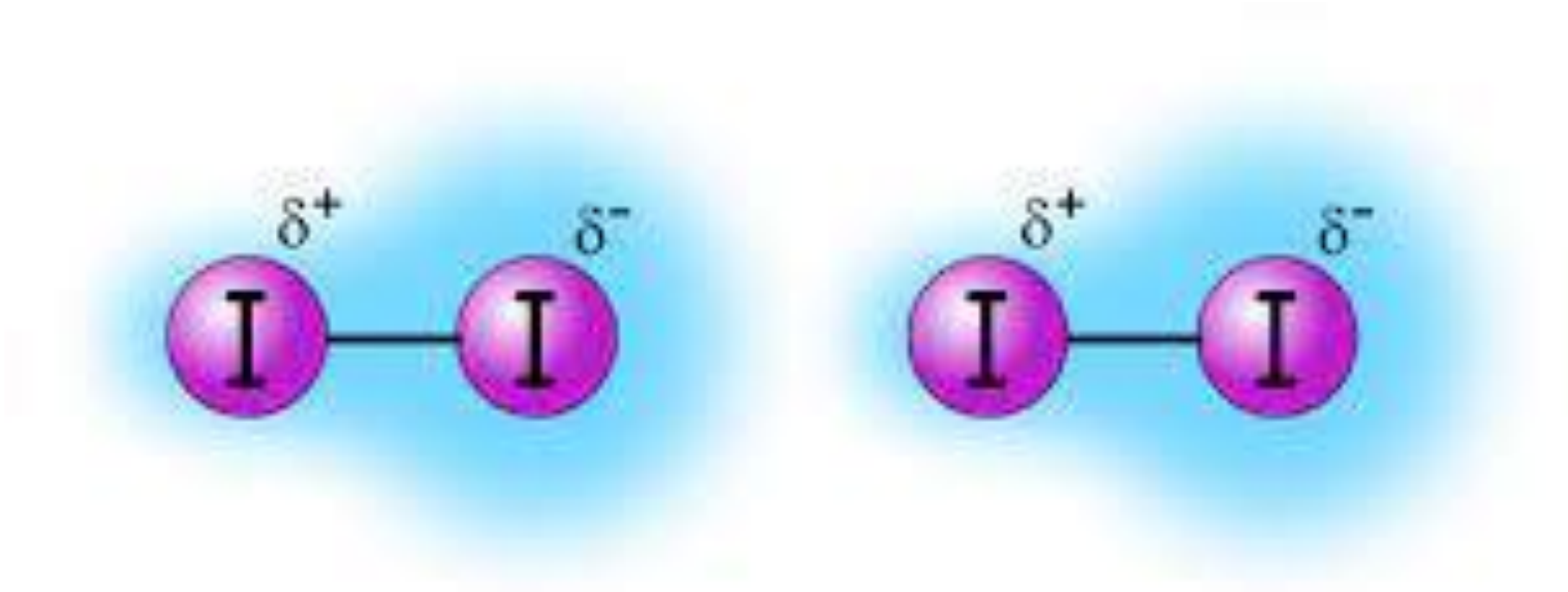


Dispersion Force or London Force

- The dispersion force or London force is a result of interaction between non-polar molecules. This force of attraction is considered as the weakest kind of intermolecular forces.





London dispersion force (I_2 bond)