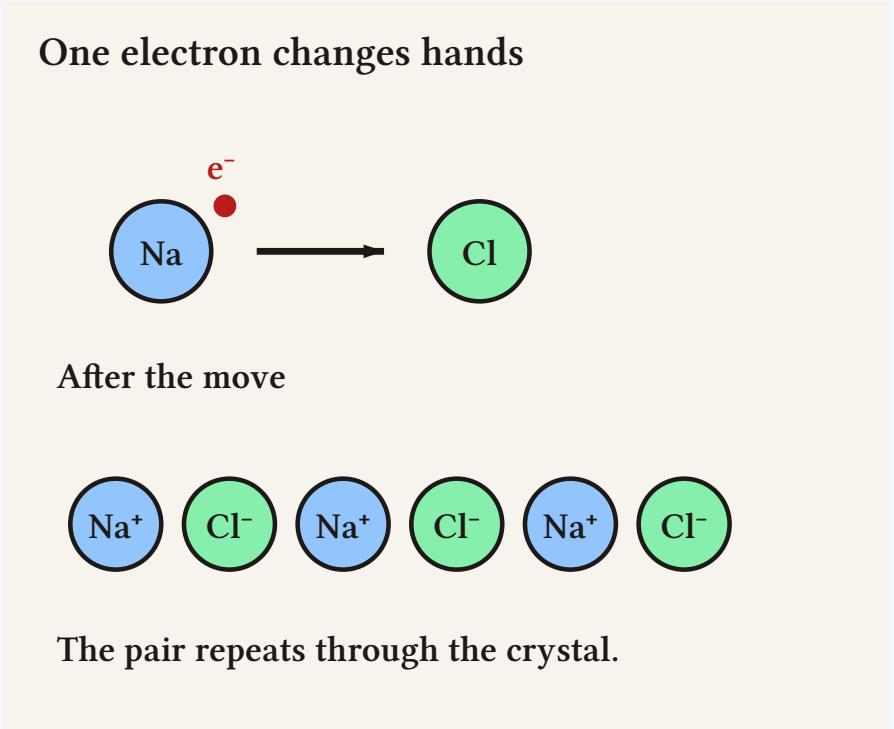
Chemistry 20

Unit A: Matter and chemical bonding

Electron transfer and the ionic bond

Table salt starts as a one-electron move

- In a salt crystal, one outer electron leaves a sodium atom and joins a chlorine atom.
- After that move you have Na^+ and Cl^-, and the crystal repeats that pair.



Four labels for one transfer

- The outer-electron count decides how the bond in NaCl forms.
- Electronegativity is how strongly an atom pulls bonding electrons. Fluorine is highest, at 4.0.

Key terms

valence electron

An outer electron counted from the main-group column before a dot diagram is drawn. (group number)

electronegativity

A unitless Pauling-scale value for an atom's pull on bonding electrons. The values rise toward fluorine. (Pauling scale)

ionic bond

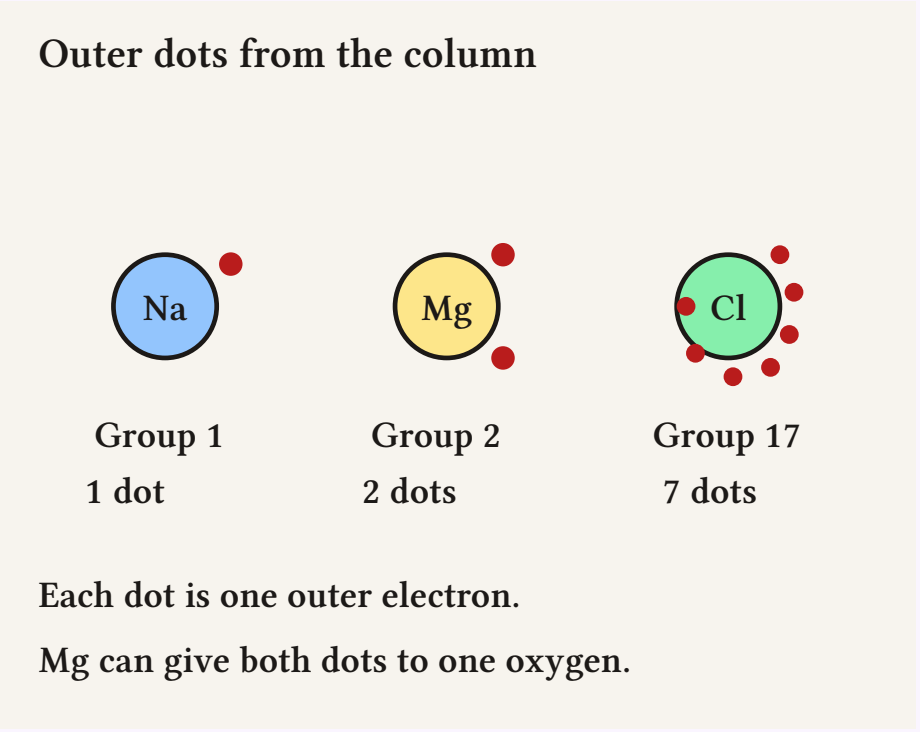
The pull that a positive ion and a negative ion exert on each other at the same time. (Na^+ with Cl^-)

intramolecular force

The bonding pull that operates inside one formula unit. (inside NaCl)

Columns choose the dot count

- Group 1 is drawn with one dot and group 17 is drawn with seven dots.
- Group 2 is drawn with two dots, so magnesium can supply two electrons to one oxygen atom.



Sodium’s dot lands on chlorine

- Start-of-transfer counts are one dot for sodium and seven dots for chlorine.
- End-of-transfer symbols are Na^{+} beside an eight-dot Cl^{-}.

Potassium hands one dot to bromine

- Potassium belongs to the same column as sodium, so the dot count is one.
- Bromine belongs to the same column as chlorine, so the dot count is seven.

Two melting points

- Sodium chloride melts at 801 °C and potassium iodide melts at 681 °C.
- The rounded Pauling differences are 2.1 for the chloride and 1.7 for the iodide.