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Chemistry

For the IB Diploma

Brighter Thinking
Better Learning

Chapter 6

The ionic model

Diagrams to show the formation of ions and ionic compounds

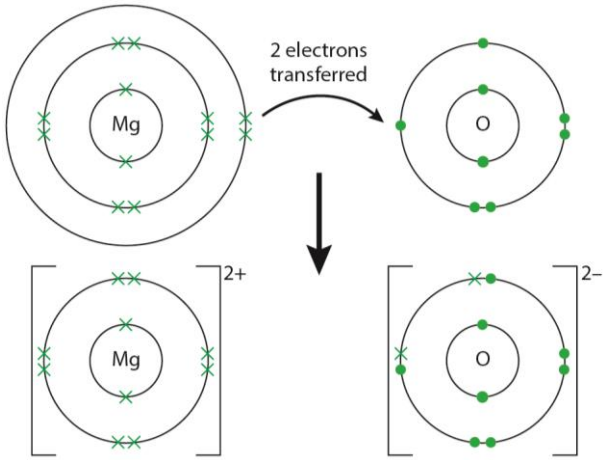

Figure 6.1: Electron transfer in ionic bonding.

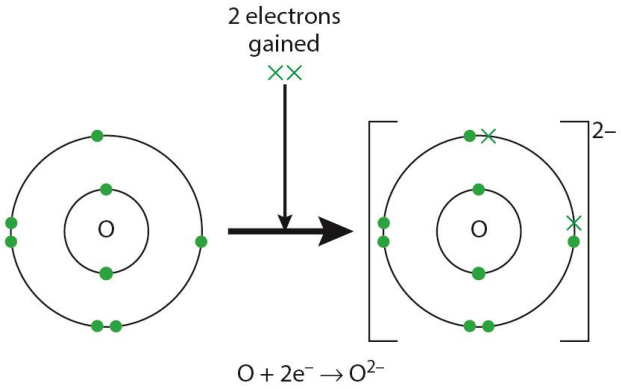

Figure 6.2: The O^{2-} ion is isoelectronic with an Ne atom.

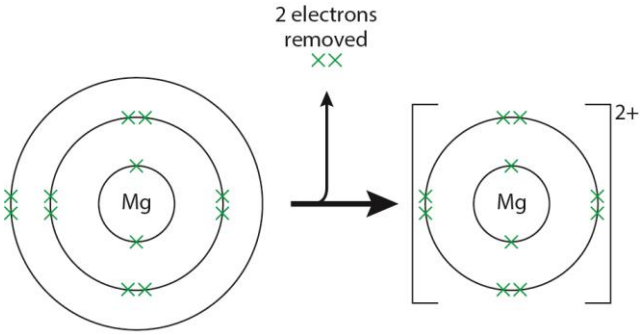

Figure 6.3: An Mg atom loses its two outer-shell electrons to form an Mg^{2+} ion. The equation here could have also be written as $Mg - 2e^- \rightarrow Mg^{2+}$, but we don't usually write equations with '–' signs in chemistry. The Mg^{2+} ion that is formed is isoelectronic with the noble gas atom neon.

3D diagram of NaCl

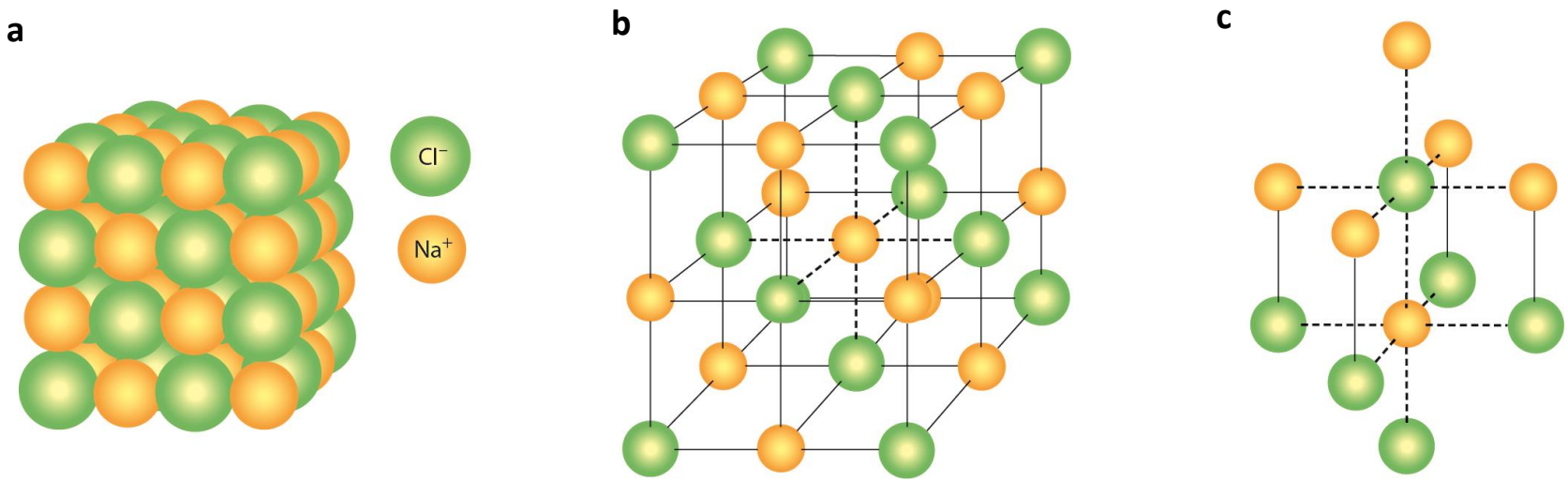

Figure 6.4: **a** A space-filling diagram of the NaCl lattice. The lattice keeps on going in three dimensions–only a tiny part of the structure is shown. **b** An expanded view of the NaCl lattice. **c** Each Na^+ ion is surrounded by six Cl^- ions in an octahedral array and vice versa. The coordination number (number of nearest neighbours) of each ion is six.

Solubility in water

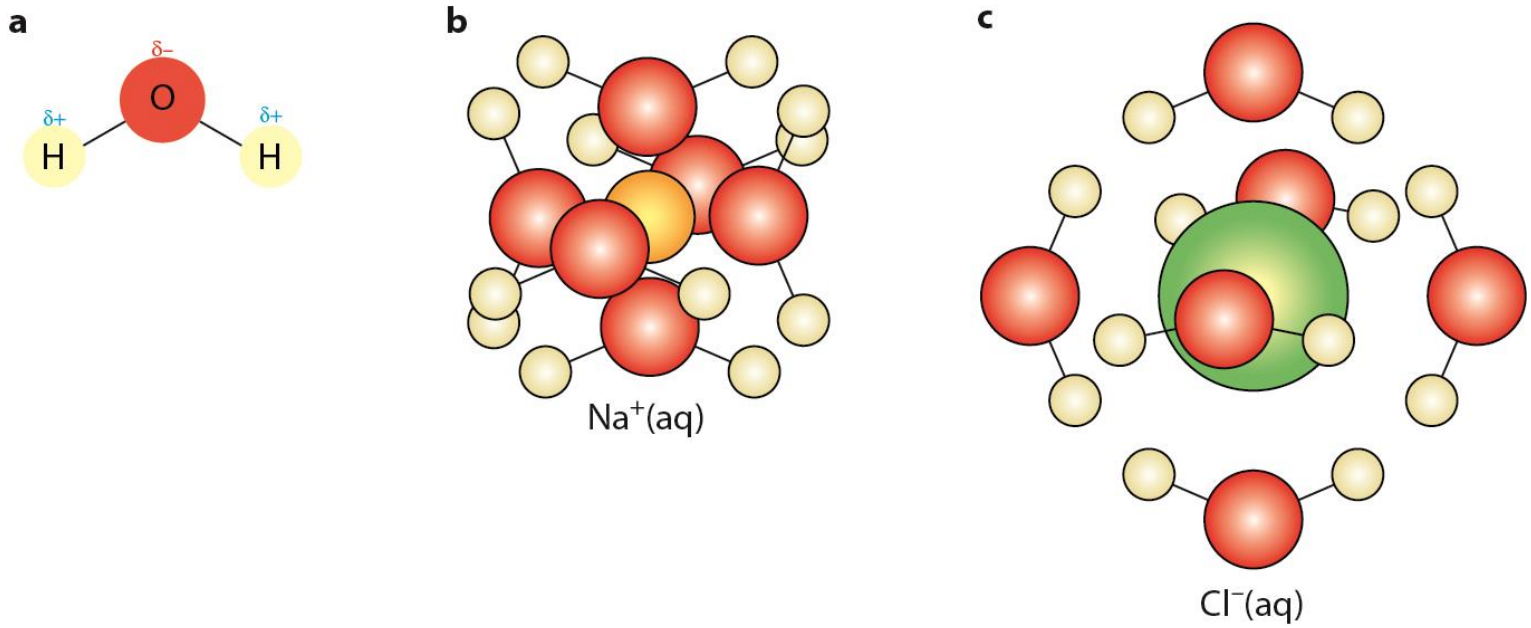

Figure 6.5: **a** A water molecule is polar. **b** A hydrated sodium ion. **c** A hydrated chloride ion.

Electrical conductivity of ionic compounds

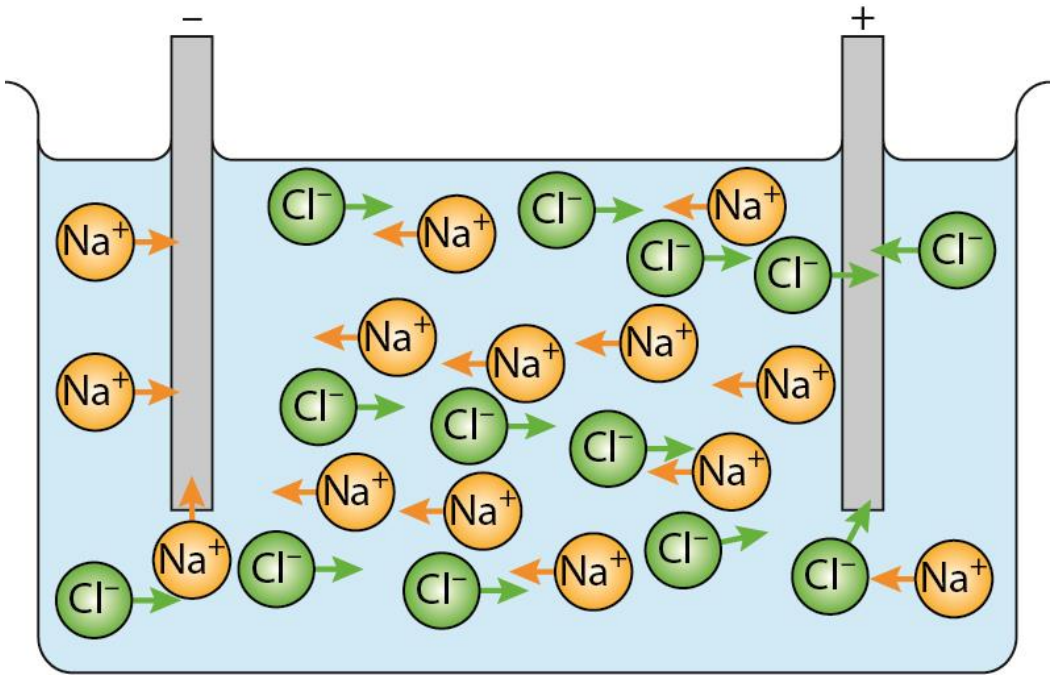

Figure 6.6: Ions move towards the oppositely charged electrode.