

Solutions

2.1 (a) Ca^{2+} ; (b) S^{2-} .

2.2 Six – a triple bond shares three pairs.

2.3 The outer electrons are delocalised/free to move through the whole structure; they carry charge through the metal.

3.1 Mg (2,8,2) loses two electrons $\rightarrow \text{Mg}^{2+}$ shown with empty outer shell; each chlorine atom gains one electron $\rightarrow$ two Cl^- with eight outer electrons, dots and crosses distinguished; correct ratio – one Mg^{2+} to two Cl^- ; formula MgCl_2 .

3.2 Covalent – non-metal atoms share one or more pairs of electrons; the shared pair attracts both nuclei, bonding the atoms in a molecule. Ionic – a metal transfers electrons to a non-metal; forming oppositely charged ions held together by electrostatic attraction in a lattice.

3.3 Any two: it suggests there are spaces/gaps between the ions, but the lattice is touching; it shows bonds as sticks, whereas the force is electrostatic attraction; only a tiny fragment of a giant structure can be drawn; the real 3D arrangement is flattened into 2D.