Electrons and bonding

Specification reference	Checklist questions	
2.2.1 a	Can you give the number of electrons that can fill the first four shells?	☐
2.2.1 b i	Can you describe atomic orbitals as a region around the nucleus that can hold up to two electrons, with opposite spins?	☐
2.2.1 b ii	Can you describe atomic orbitals the shapes of s- and p-orbitals?	☐
2.2.1 b iii	Can you describe atomic orbitals the number of orbitals making up s-, p- and d-sub-shells, and the number of electrons that can fill s-, p- and d-sub-shells?	☐
2.2.1 c i	Can you describe filling of orbitals for the first three shells and the 4s and 4p orbitals in order of increasing energy?	☐
2.2.1 c ii	Can you describe filling of orbitals for orbitals with the same energy, occupation singly before pairing?	☐
2.2.1 d i	Can you deduct the electron configurations of atoms, given the atomic number, up to $Z = 36$?	☐
2.2.1 d ii	Can you deduct the electron configurations of: ions, given the atomic number and ionic charge, limited to s- and p- blocks up to $Z = 36$?	☐
2.2.2 a	Can you describe ionic bonding as electrostatic attraction between positive and negative ions, and the construction of '*dot-and-cross*' diagrams?	☐
2.2.2 b	Can you explain the solid structures of giant ionic lattices, resulting from oppositely charged ions strongly attracted in all directions (e.g. NaCl)?	☐
2.2.2 c	Can you explain the effect of structure and bonding on the physical properties of ionic compounds, including melting and boiling points, solubility and electrical conductivity in solid, liquid and aqueous states?	☐

5 Electrons and bonding Checklist

Specification reference	Checklist questions	
2.2.2 d	Can you describe covalent bond as the strong electrostatic attraction between a shared pair of electrons and the nuclei of the bonded atoms?	☐
2.2.2 e	Can you construct '*dot-and-cross*' diagrams of molecules and ions?	☐
2.2.2 e i	Can you construct '*dot-and-cross*' diagrams of molecules and ions to describe single covalent bonding?	☐
2.2.2 e ii	Can you construct '*dot-and-cross*' diagrams of molecules and ions to describe multiple covalent bonding?	☐
2.2.2 e iii	Can you construct '*dot-and-cross*' diagrams of molecules and ions to describe dative covalent (coordinate) bonding?	☐
2.2.2 f	Can you use the term *average bond enthalpy* as a measurement of covalent bond strength?	☐