

Solutions

Each answer shows the steps, then the **result**.

2.1

- the enthalpy change when 1 mol of an ionic solid (lattice) forms from its gaseous ions

2.2

- the atom gains an electron, and the attraction of the nucleus for the added electron releases energy

3.1 B

- Atomisation always requires energy (bonds break), so it is positive

3.2 B

- EA becomes less exothermic down the group

3.3

(a)

- $\Delta H_{\text{latt}} = \Delta H_f - [\Delta H_{\text{at}}(\text{Na}) + \text{IE}_1 + \Delta H_{\text{at}}(\text{Cl}) + \text{EA}_1]; = -411 - [107 + 496 + 122 - 349]$
 $= -411 - 376 = -787 \text{ kJ mol}^{-1}$

(b)

- strong electrostatic attractions form between the oppositely charged ions (energy released)

3.4

- MgO has ions with higher charges ($2+/2-$) and smaller radii than NaCl; so the electrostatic attraction is much stronger, making the lattice energy more exothermic