Chapter 12
Lattice enthalpy

Print out and complete this worksheet to generate a summary for Chapter 12.

1 Use equations to define each of the following.

a lattice enthalpy of potassium oxide

.....

b enthalpy of atomisation of bromine

.....

c second electron affinity of oxygen

.....

d enthalpy of hydration of Mg^{2+}

.....

e enthalpy of solution of magnesium chloride

.....

2 a Construct a Born–Haber cycle that could be used to determine the lattice enthalpy of calcium chloride.

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b Use the information below to calculate the lattice enthalpy of calcium chloride.

Enthalpy of atomisation of calcium= +108 kJ mol^{-1}

1st ionisation enthalpy of calcium = +590 kJ mol^{-1}

1st ionisation enthalpy of calcium = +1100 kJ mol^{-1}

Enthalpy of atomisation of chlorine = +122 kJ mol^{-1}

1st electron affinity of chlorine = –364 kJ mol^{-1}

Enthalpy of formation of calcium chloride = –795 kJ mol^{-1}

3 For each of the following pairs of compounds, explain which would have the largest numerical value for its lattice enthalpy.

a sodium chloride or magnesium chloride

b barium chloride or calcium chloride

c calcium chloride or calcium bromide

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4 Use the information below to calculate the enthalpy of solution of barium chloride:

Enthalpy of hydration of Cl^- = –384.1 kJ mol^{-1}

Enthalpy of hydration of Ba^{2+} = –1272.8 kJ mol^{-1}

Lattice enthalpy of $BaCl_2$ = –1958 kJ mol^{-1}

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