



Lattice enthalpies can be determined experimentally using a Born–Haber cycle and theoretically using calculations based on electrostatic principles.

- (a) The experimental lattice enthalpies of the chlorides of lithium, LiCl , sodium, NaCl , potassium, KCl , and rubidium, RbCl , are given in Table 13 of the Data Booklet. Explain the trend in the values. [2]

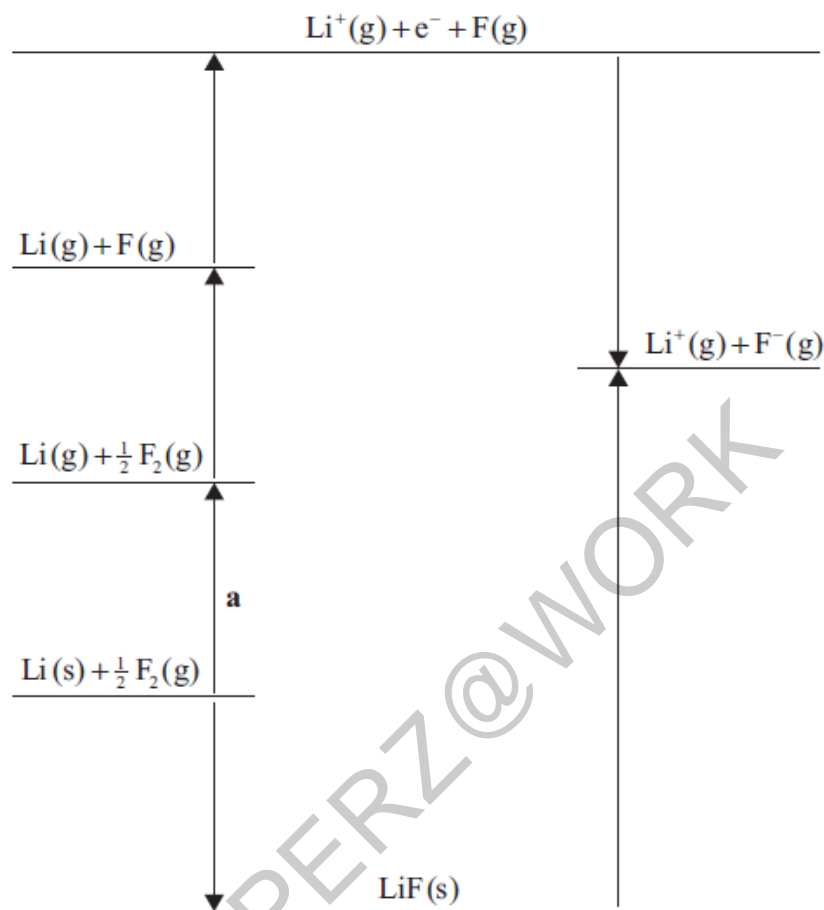
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- (b) Explain why magnesium chloride, MgCl_2 , has a much greater lattice enthalpy than sodium chloride, NaCl . [2]

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- (c) (i) Identify the process labelled **a** on the Born–Haber cycle for the determination of the standard enthalpy of formation of lithium fluoride, LiF . [1]

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- (ii) The enthalpy change for process a is $+159 \text{ kJ mol}^{-1}$. Calculate the standard enthalpy of formation of lithium fluoride, LiF, using this and other values from the Data Booklet. [2]

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