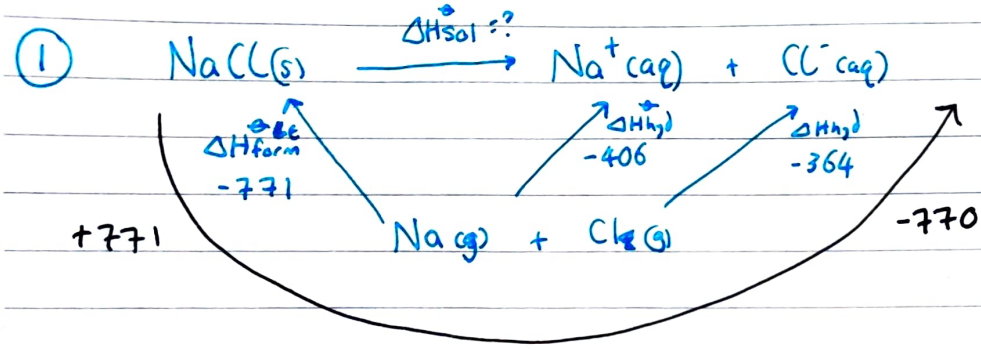
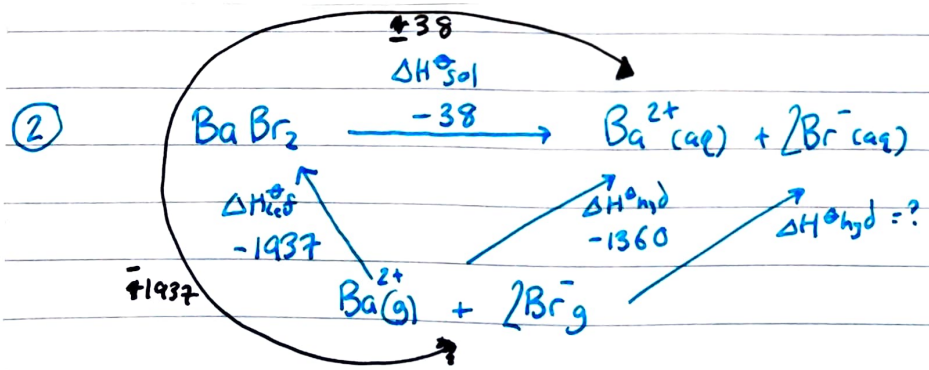
# Enthalpy of Solution Calculations - Answers

**1** Calculate the enthalpy of solution of NaCl given that the lattice enthalpy of formation of NaCl is –771 kJmol$^{-1}$ and the enthalpies of hydration of sodium and chloride ions are –406 and –364 kJmol$^{-1}$ respectively.




$771 + (-770) = +1 \text{ kJmol}^{-1}$

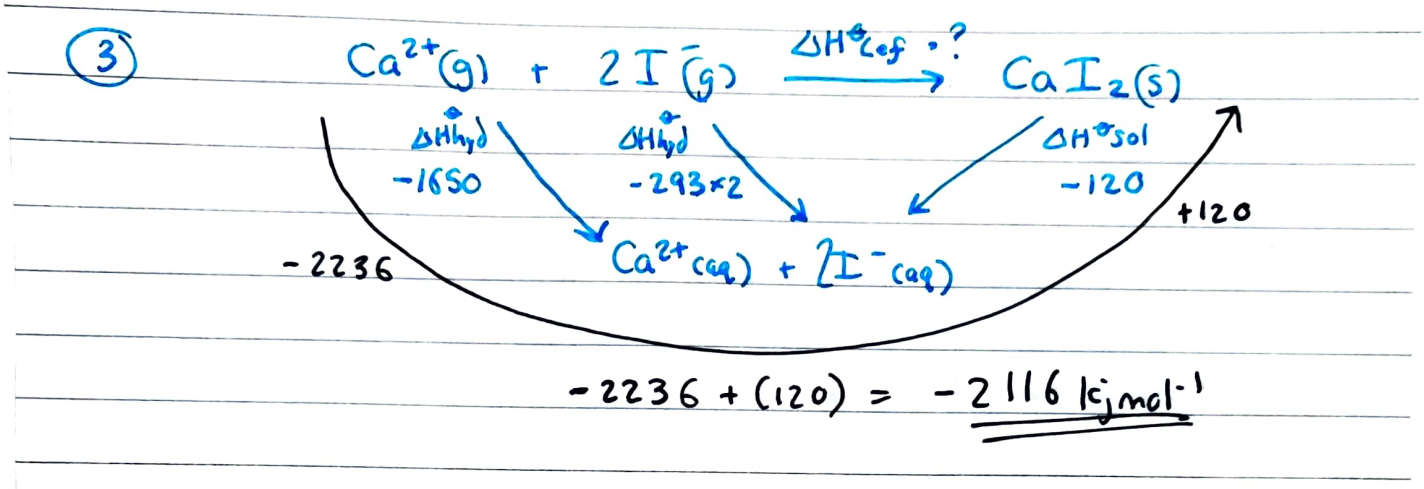
**2** Calculate the enthalpy of hydration of bromide ions given that the hydration enthalpy of barium ions is –1360 kJmol$^{-1}$, the lattice enthalpy of formation for $BaBr_2$ is –1937 kJmol$^{-1}$ and the enthalpy of solution of $BaBr_2$ = –38 kJmol$^{-1}$.




$-38 + (-1937) = -1975$

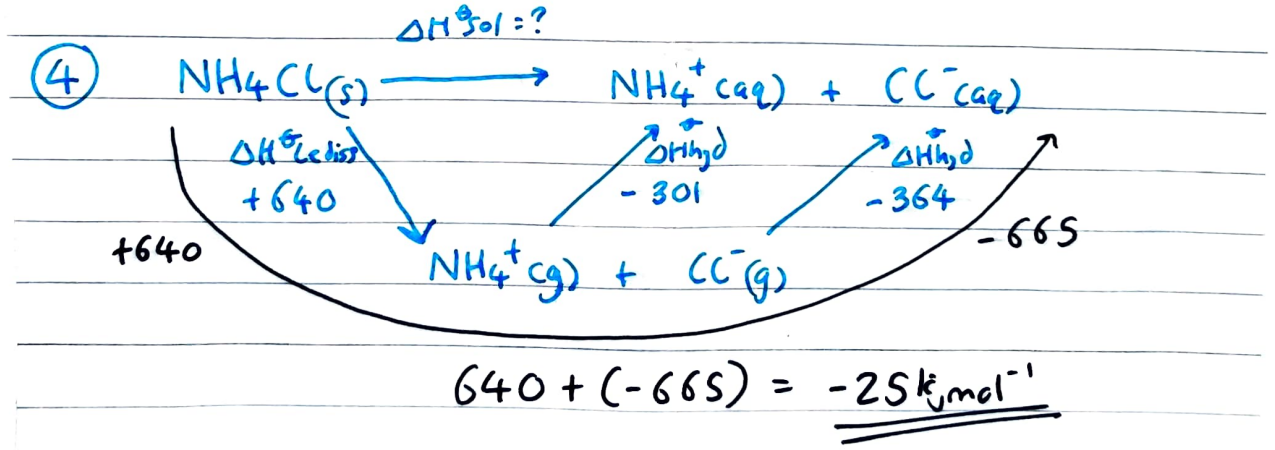
$-1975 + (-1360) = -615$ $\qquad \frac{-615}{2} = -307.5 \text{ kJmol}^{-1}$

**3** Calculate the lattice enthalpy of formation of calcium iodide given that its enthalpy of solution is –120 $kJmol^{-1}$ and the enthalpies of hydration of calcium and iodide ions are –1650 and –293 $kJmol^{-1}$ respectively.




$-2236 + (120) = -2116\ kJmol^{-1}$

**4** Calculate the enthalpy of solution of the ammonium chloride using this data: $\Delta H_{hyd}$ (kJ $mol^{-1}$): $NH_4^+$ –301; $Cl^-$ –364; Lattice enthalpy of dissociation (kJ $mol^{-1}$): ammonium chloride +640 kJ $mol^{-1}$.




$640 + (-665) = -25\ kJmol^{-1}$