Question	Marking Guidance	Mark	Comments
2(a)	Chloride (ions) are smaller (than bromide ions)	1	Must state or imply ions. Allow chloride has greater charge density (than bromide). Penalise chlorine ions once only (max 2/3).
	So the force of attraction between chloride ions and water is stronger	1	This can be implied from M1 and M3 but do not allow intermolecular forces.
	Chloride ions attract the $\delta+$ on H of water / electron deficient H on water	1	Allow attraction between ions and polar / dipole water. Penalise H^+ (ions) and mention of hydrogen bonding for **M3** Ignore any reference to electronegativity. Note: If water not mentioned can score M1 only.
2(b)	$\Delta H_{solution} = \Delta H_L + \Delta H_{hyd}\ K^+$ ions + $\Delta H_{hyd}\ Br^-$ ions / = 670 – 322 – 335	1	Allow $\Delta H_{solution} = \Delta H_L + \Sigma\Delta H_{hyd}$
	= (+)13 (kJ mol^{-1})	1	Ignore units even if incorrect. +13 scores M1 and M2 -13 scores 0 -16 scores M2 only (transcription error).

2(c)(i)	The entropy change is positive / entropy increases	1	ΔS is negative loses M1 and M3
	Because 1 mol (solid) $\rightarrow$ 2 mol (aqueous ions) / no of particles increases	1	Allow the aqueous ions are more disordered (than the solid). Mention of atoms / molecules loses M2
	Therefore $\underline{T\Delta S > \Delta H}$	1	
2(c)(ii)	Amount of KCl = $5/M_r = 5/74.6 = \underline{0.067(0) \text{ mol}}$	1	If moles of KCl not worked out can score M3, M4 only (answer to M4 likely to be 205.7 K)
	Heat absorbed = $17.2 \times 0.0670 = 1.153$ kJ	1	Process mark for M1 × 17.2
	Heat absorbed = mass × sp ht × ΔT $(1.153 \times 1000) = 20 \times 4.18 \times \Delta T$	1	If calculation uses 25 g not 20, lose M3 only (M4 = 11.04, M5 = 287)
	$\Delta T = 1.153 \times 1000 / (20 \times 4.18) = 13.8$ K	1	If 1000 not used, can only score M1, M2, M3 M4 is for a correct ΔT Note that 311.8 K scores 4 (M1, M2, M3, M4).
	$T = 298 - 13.8 = 284(.2)$ K	1	If final temperature is negative, M5 = 0 Allow no units for final temp, penalise wrong units.