

3(a)	number of possible arrangements of particles and energy in a system											
3(b)(i)	<table><tr><td>process</td><td>ΔS is negative</td><td>ΔS is positive</td></tr><tr><td>steam condensing into water</td><td>✓</td><td></td></tr><tr><td>solid KCl dissolving into water</td><td></td><td>✓</td></tr></table>			process	ΔS is negative	ΔS is positive	steam condensing into water	✓		solid KCl dissolving into water		✓
process	ΔS is negative	ΔS is positive										
steam condensing into water	✓											
solid KCl dissolving into water		✓										
3(b)(ii)	M1: three numbers and correct multipliers used M2: correct signs and evaluation $\Delta S^\circ = (3 \times 203.0) + (223.1) - (2 \times 281.6) = (+)268.9 \text{ (J K}^{-1} \text{ mol}^{-1})$											
3(c)(i)	positive AND gas produced / on the right OR less / no gas on left											
3(c)(ii)	M1 and M2: calculation of gradient from the graph for ΔS gradient = $(-)/140 / 900 = (-)0.1556$ $\Delta S^\circ = (-)0.1556 \times 1000$ = $(+)155.6 \pm 5 \text{ (J K}^{-1} \text{ mol}^{-1})$ M3: $T = 1120 \pm 5 \text{ (K)}$ M4: $\Delta H^\circ = (+)172 \pm 10 \text{ (kJ mol}^{-1})$											