Question	Marking Guidance	Mark	Comments
3(a)	$\Delta G = \Delta H - T\Delta S$	1	Or expression $\Delta H - T\Delta S$ must be evaluated
	If ΔG / expression <=0 reaction is feasible	1	Or any explanation that this expression <=0 Do not allow just $\Delta G = 0$
3(b)	The molecules become more disordered / random when water changes from a liquid to a gas / evaporates	1	For M1 must refer to change in state AND increase in disorder
	Therefore the entropy change is positive / Entropy increases	1	Only score M2 if M1 awarded
	$T\Delta S > \Delta H$	1	Allow M3 for *T* is large / high (provided M2 is scored)
	$\Delta G < 0$	1	Mark M3, M4 independently
3(c)(i)	Condition is $T = \Delta H/\Delta S$	1	
	ΔS = 189 –205/2 – 131 = –44.5;	1	
	ΔH = –242 therefore T = (–242 × 1000)/–44.5)	1	
	= 5438 K (allow 5400 – 5500 K)	1	Units essential (so 5438 alone scores 3 out of 4) 2719 K allow score of 2 5.4 (K) scores 2 for M1 and M2 only 1646 (K) scores 1 for M1 only
3(c)(ii)	It would decompose into <u>hydrogen and oxygen</u> / its elements	1	Can score this mark if mentioned in M2
	Because ΔG for this reaction would be <= 0	1	Allow the reverse reaction / decomposition is feasible Only score M2 if M1 awarded

3(d)	$\Delta H = T\Delta S$	1	Allow correct substituted values instead of symbols
	ΔS = 70-189 = -119 $J K^{-1} mol^{-1}$	1	
	ΔH = (-119 × 373)/1000 = -44.4 kJ (mol^{-1}) (allow -44 to -45)	1	Allow -44000 to -45000 J (mol^{-1}) Answer must have correct units of kJ or J