Question	Part	Sub Part	Marking Guidance	Mark	Comments
5	(a)		No disorder (or maximum order or molecules stationary)	1	Allow by definition Do not allow just 'particles are ordered'
5	(b)		Molecules <u>vibrate</u> more (so more disorder)	1	
5	(c)		Melting point of ammonia	1	
5	(d)		Molecules changing from liquid to gas <u>Big</u> increase in disorder or <u>much more</u> random movement	1 1	Allow becomes a gas Allow gases are <u>very</u> disordered
5	(e)	(i)	= Σentropy products – Σentropy reactants Or = 193 – 0.5×192 – 1.5×131 = –99.5 J K^{-1} mol^{-1}	 1 1	
5	(e)	(ii)	$\Delta G = \Delta H - T\Delta S$ When $\Delta G = 0$ $T = \Delta H/\Delta S$ = –46.2×1000/–99.5 = 464 K	1 1 1 1	 Allow conseq on wrong ΔS Allow 568 K if use given ΔS
5	(e)	(iii)	No longer spontaneous or yield decreases	1	Either point scores do not allow 'formation of ammonia decreases' Must say or imply clearly that yield of ammonia decreases or equilibrium shifts to left.