Question	Marking Guidance	Mark	Comments
4(a)	$\Delta H = \Sigma(\Delta H_f$ products) - $\Sigma(\Delta H_f$ reactants) /= +34 - +90 = -56 kJ mol^{-1}	1 1	Allow correct cycle Ignore no units, penalise incorrect units
4(b)	$\Delta S = \Sigma(S$ products) - $\Sigma(S$ reactants) /= 240 - (205 +211/2) = -70.5 J K^{-1} mol^{-1} / -0.0705 kJ K^{-1} mol^{-1}	1 1	 Ignore no units, penalise incorrect units Allow -70 to -71/-.070 to -.071
4(c)	$T = \Delta H/\Delta S$ / T = (Ans to part(a) $\times$1000)/ans to part(b) /= -56/(-70.5 $\div$ 1000) = 794 K (789 to 800 K)	1 1	Mark consequentially on answers to parts (a) and (b) Must have correct units Ignore signs; allow + or – and –ve temps
4(d)	Temperatures exceed this value	1	
4(e)	$N_2 + O_2 \rightarrow 2NO$	1	Allow multiples
4(f)	there is no change in the number of moles (of gases) So entropy/disorder stays (approximately) constant / entropy/disorder change is very small / ΔS=0 / $T\Delta S$=0	1 1	Can only score these marks if the equation in (e) has equal number of moles on each side Numbers, if stated must match equation