



$$\Delta S_R^\circ = S_{\text{SiO}_2}^\circ - S_{\text{Si}}^\circ - 2 S_{\text{O}_2}^\circ$$

$$= 330.86 - 18.82 - 2 \cdot 223.08$$

$$= -134.12 \text{ J/K}$$

$$\Delta S'_{\text{AMB}} = - \frac{\Delta H}{T}$$

$$\Delta H_R^\circ = -662.75 \text{ kJ}$$

NEL CALCOLO ABBIAMO USATO
IL FATTO CHE $\Delta H_{\text{Si}}^\circ$ e $\Delta H_{\text{O}_2}^\circ$ E' 0
PER DEFINIZIONE

$$\begin{aligned} \Delta S'_{\text{AMB}} &= \frac{+662.75}{T} \\ &= 2.2 \text{ kJ/K} \end{aligned}$$

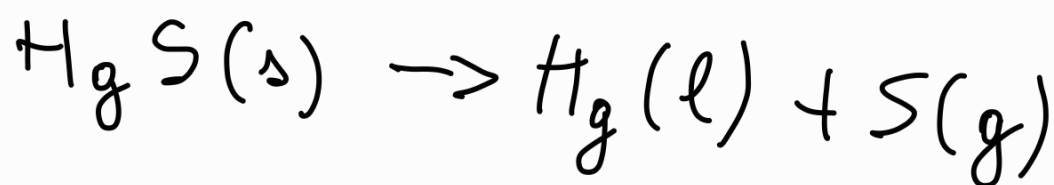
$$\Delta S_{\text{UNIV}} = \Delta S_{\text{SIST}} + \Delta S_{\text{AMB}}$$

$$= -134.12 \cdot 10^{-3} + 2.2$$

$$= 2.07 \text{ kJ/K}$$

SPONTANEA $\Delta S_{\text{UNIV}} > 0$

② STIMARE LA T PER
DECOMPORRE $\text{HgS}(s)$ IN $\text{Hg}(l)$
E $\text{S}(g)$



$$\Delta H_R^\circ = \Delta H_f^\circ(\text{S}(s)) + \Delta H_f^\circ(\text{Hg}(l)) - \Delta H_f^\circ(\text{HgS}(s))$$

$$= 278.98 + 0 - (-58.0)$$

$$= 337.1 \text{ kJ/mol}$$

$$\Delta S^\circ_R = S^\circ(S(\Delta)) + S^\circ(H_2(g)) - S^\circ(H_2S(\Delta))$$

$$= 167.83 + 76.02 - 82.4$$

$$= 161.45 \text{ J/K}$$

$$\Delta G^\circ = \Delta H^\circ - T \Delta S^\circ$$

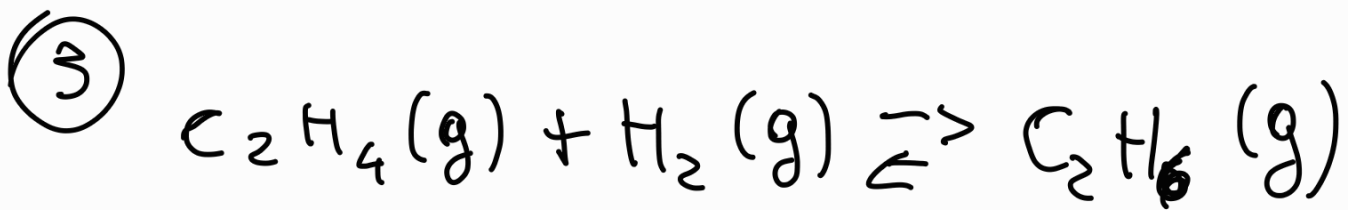
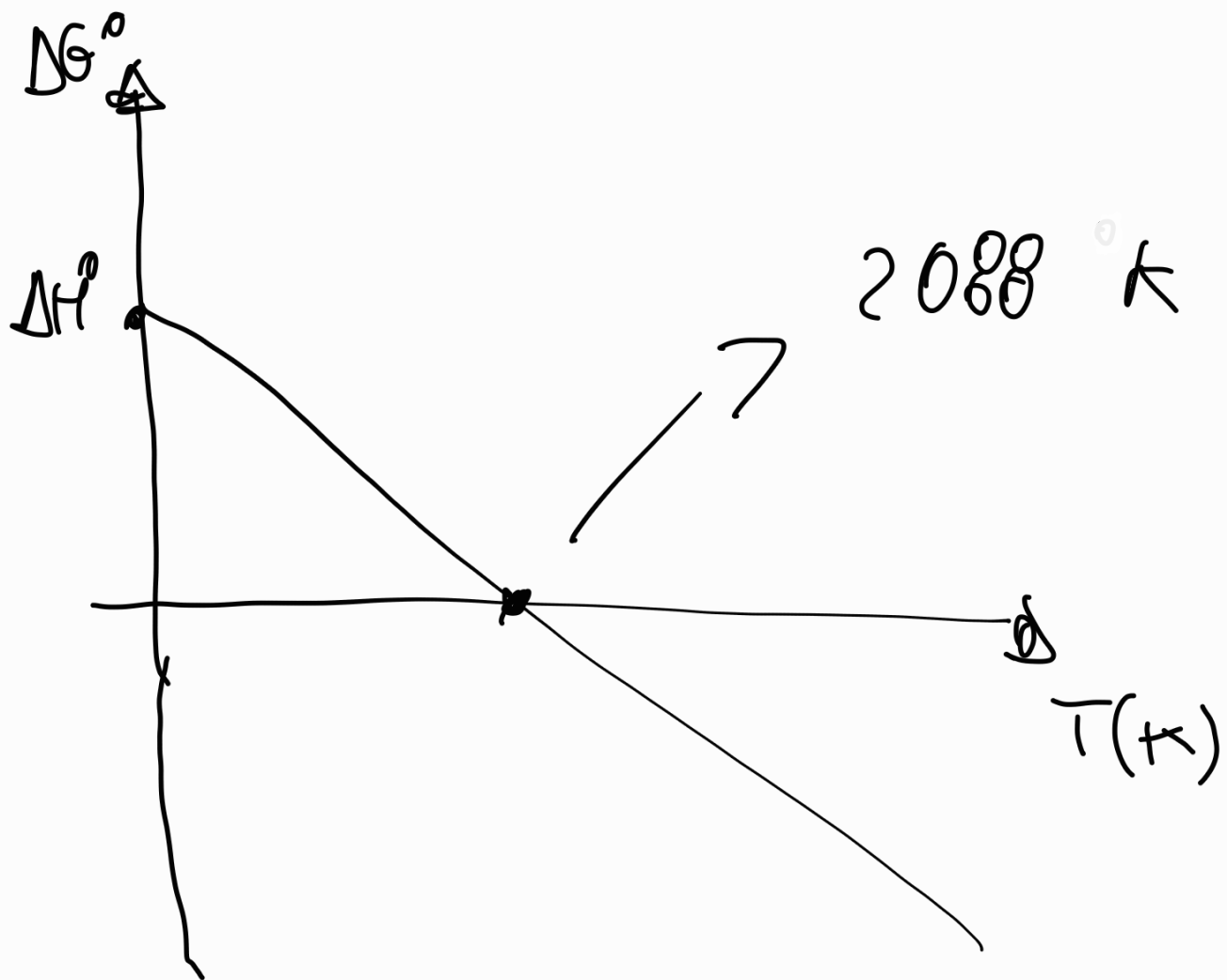
VOLLO VEDERE QUANDO $\Delta G^\circ < 0$

DA CUI:

$$\Delta H^\circ - T \Delta S^\circ < 0$$

$$T \Delta S^\circ > \Delta H^\circ$$

$$T > \frac{\Delta H^\circ}{\Delta S^\circ} \Rightarrow \underline{2088 \text{ K}}$$



$$\Delta G^\circ_{\text{R}} = \Delta G^\circ_f(\text{C}_2\text{H}_6) - \Delta G^\circ_f(\text{H}_2(\text{g})) - \Delta G^\circ_f(\text{C}_2\text{H}_4(\text{g}))$$

$\rightarrow$ STANDARD

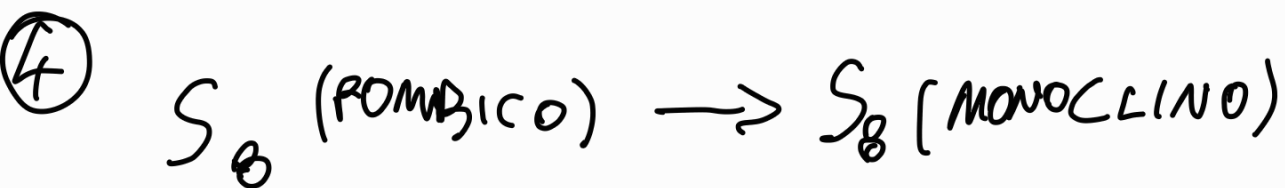
$$= -31.89 - 0 - 68.35$$

$$= -100.24 \text{ kJ}$$

$$\Delta G^\circ = -RT \ln K$$

$$K = e^{-\Delta G^\circ / RT} = \underline{\underline{3.73 \cdot 10^{17}}}$$

SPONTANEA SPOSTATA VERSO I
PRODOTTI



$$\Delta H^\circ = 3.213 \text{ kJ}$$

$$\Delta S^\circ = 8.7 \text{ J/K}$$

$$\begin{aligned} \Delta G^\circ &= \Delta H^\circ - T \Delta S^\circ \\ &= 3.213 - T \cdot 8.7 \end{aligned}$$

a) $T = 353^\circ \text{ K}$

$$\Delta G^\circ = 141.9 \text{ J}$$

NON SPONTANEA
ROMBICO PIÙ STABILE

$$T = 383 \text{ K}$$

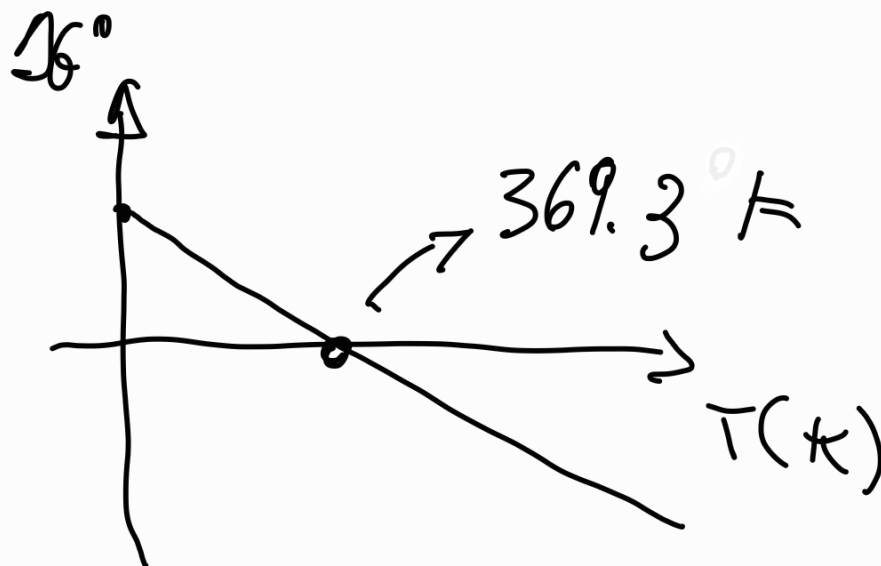
$$\Delta G^\circ = -119.1 \text{ J}$$

SPONTANEA MONOCLINO PIÙ
STABILE

$$b) \Delta G^\circ = 0 \Rightarrow \Delta H^\circ = T \Delta S^\circ$$

$$\text{DA CUI } T = \frac{\Delta H^\circ}{\Delta S^\circ} = 369.3 \text{ K}$$

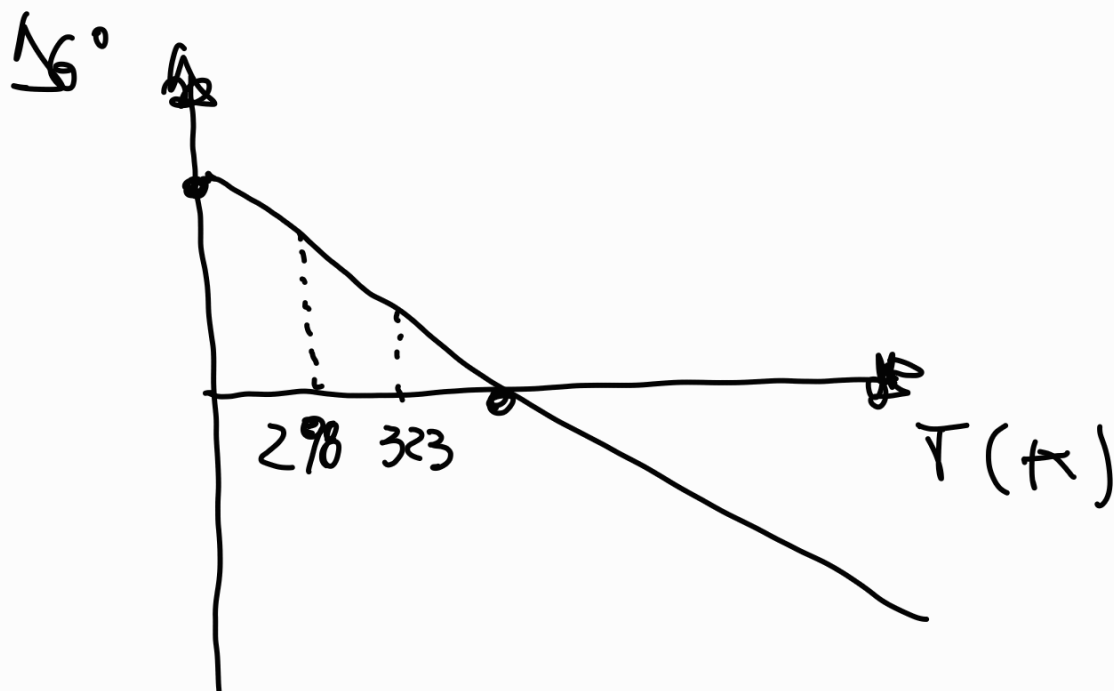
EQUILIBRIO



$$1 \text{ atm} =$$

5

$$\Delta G^{\circ} = \Delta H^{\circ} - T \Delta S^{\circ}$$



$$\Delta G^{\circ}_{298\text{ K}} = 124 \cdot 10^3 - 298 \cdot 182$$

$$= 69.76 \text{ KJ}$$

NON SPONTANEA

$$\Delta G^{\circ}_{323\text{ K}} = 65.21 \text{ KJ}$$

NON SPONTANEA

B

- 6) a) $\Delta S < 0$ PASSO A SOLIDO DA AQ.
 b) $\Delta S < 0$ PASSO DA GAS A SOLIDO

c) $\Delta S > 0$ PASSO DA 1 GAS A 2 GAS

d) $\Delta S > 0$ PASSO DA SOLIDO A GAS

c e d

[C]

7

$$\Delta G^\circ = \Delta H^\circ - T \Delta S^\circ$$

$$= 493.7 \cdot 10^3 - 1273 \cdot 544.4$$

$$= -199.32 \text{ kJ}$$

$$K = e^{-\Delta G^\circ / RT} = \underline{1.51 \cdot 10^8}$$

[C]
