

RESPOSTA - ATIVIDADE 2

$$U = \frac{3}{2} PV, (V_A, P_A) \rightarrow (V_B, P_B), V_B = \lambda V_A, \lambda > 1$$

Variac o de entropia: $dS = \frac{1}{T} dU + \frac{P}{T} dV$

$$\Delta S = \int_A^B \frac{3}{2} \frac{1}{T} (P dV + V dP) + \int_A^B \frac{P dV}{T}$$

$$\Delta S = \int_A^B \frac{3}{2} \frac{V dP}{T} + \int_A^B \frac{5}{2} \frac{P dV}{T}$$

Processo isot rmico: $T = T_0 \Rightarrow PV = nRT_0$

$$\Rightarrow \Delta S = \int_A^B \frac{3}{2} nR \frac{dP}{P} + \int_A^B \frac{5}{2} nR \frac{dV}{V}$$

$$\Delta S = \frac{3}{2} nR \ln(P_B/P_A) + \frac{5}{2} nR \ln(V_B/V_A)$$

$$P_A V_A = nRT_0 \Rightarrow P_A = nRT_0/V_A$$

$$P_B V_B = nRT_0 \Rightarrow P_B \lambda V_A = nRT_0 \Rightarrow P_B = \frac{nRT_0}{\lambda V_A} \left. \vphantom{P_B \lambda V_A = nRT_0} \right\} \Rightarrow P_B = \frac{P_A}{\lambda}$$

$$\Rightarrow \Delta S = \frac{3}{2} nR \ln(1/\lambda) + \frac{5}{2} nR \ln(\lambda)$$

$$\Delta S = -\frac{3}{2} nR \ln(\lambda) + \frac{5}{2} nR \ln(\lambda) \Rightarrow \boxed{\Delta S = nR \ln \lambda}$$

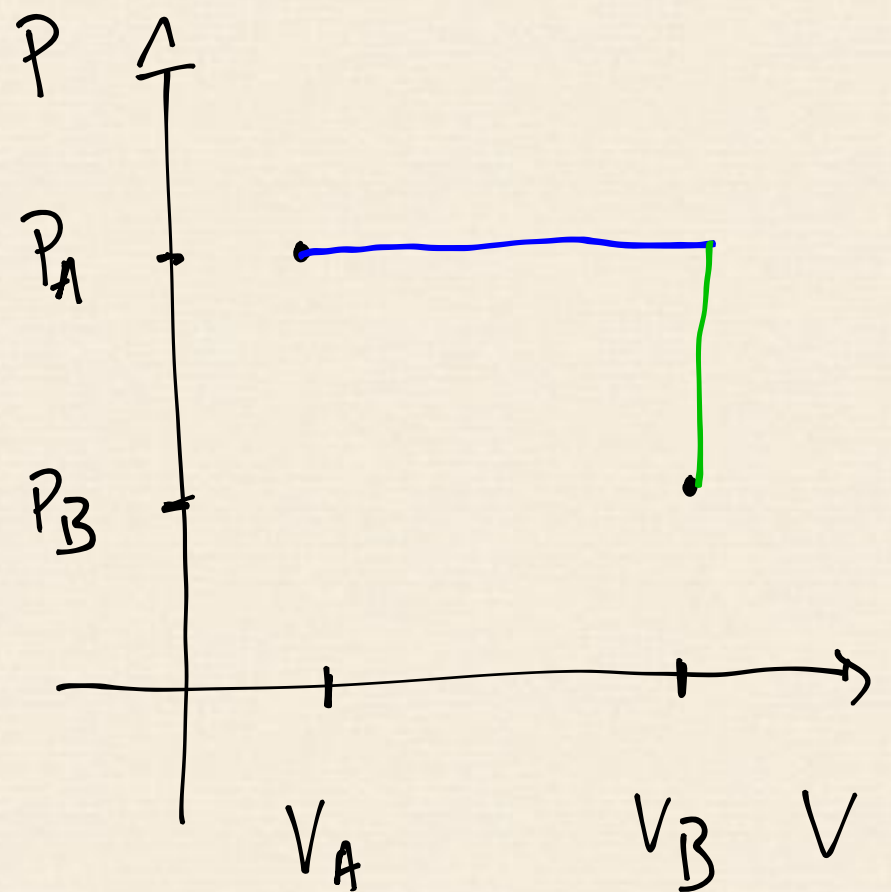
$$\Delta S = \int_A^B \frac{3}{2} nR \frac{dP}{P} + \int_A^B \frac{5}{2} nR \frac{dV}{V}$$

Processos isotérmico + isocórico

$$\Delta S_1 = \frac{5}{2} nR \ln(V_B/V_A) = \frac{5}{2} nR \ln \lambda$$

$$\Delta S_2 = \frac{3}{2} nR \ln(P_B/P_A) = -\frac{3}{2} nR \ln \lambda$$

$$\Delta S_{TOTAL} = \Delta S_1 + \Delta S_2 = nR \ln \lambda //$$



Mesmo valor que
no processo anterior
pois os estados inicial e
final são os mesmos.