Examen de Septiembre 18/19- Original
Notas de Resolución
Termodinámica Química
2º Grado en Química UNED
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1.

a) $C_V = \left(\frac{\partial U}{\partial T}\right)_V = \frac{3}{2}R$

b) $\left(\frac{\partial U}{\partial V}\right)_T = T\left(\frac{\partial P}{\partial T}\right)_V - P \rightarrow \beta = \frac{1}{T}\left[1+\frac{1}{P}\left(\frac{\partial U}{\partial V}\right)_T\right] = \frac{1}{T}\left[1+\frac{a}{PV^2}\right]$

2.

$GAS\ IDEAL: PV = RT$

$ADIABÁTICA: PV^{\gamma} = Cte$

$\kappa_T = -\frac{1}{V}\left(\frac{\partial V}{\partial P}\right)_T = \frac{1}{P}$

$\kappa_S = -\frac{1}{V}\left(\frac{\partial V}{\partial P}\right)_S = \left\{V = cte' P^{-1/\gamma}\right\} = -\frac{1}{cte' P^{-1/\gamma}} cte'\left(-\frac{1}{\gamma}\right) P^{-1/\gamma-1} = \frac{1}{\gamma P} = \frac{\kappa_T}{\gamma}$

Como $\gamma = 5/3 \rightarrow \kappa_S < \kappa_T$

3. PEC 18/19- Pregunta 3

4. PEC 18/19- Pregunta 4

5. PEC 18/19- Pregunta 5

6.

a)

$\Delta G^0 = -RT\ln K_P = -8,3145 \times 1500 \times \ln(2,95937854) = -13531,59051 J/mol \approx -13531,591 J/mol$

b)

$P_T = P_A + P_B + P_C + P_D = 190,7 atm$

$n_T = n_A + n_B + n_C + n_D = \frac{P_T V}{RT} = \frac{190,7 \times 8}{0,08205 \times 1500} = 12,39569368\ moles$

$x_A = P_A / P_T \rightarrow n_A = x_A n_T \rightarrow n_A = 3,257$