

Examen de Septiembre 18/19- Original  
 Notas de Resolución  
 Termodinámica Química  
 2º Grado en Química UNED  
 Curso: 2018-2019  
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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)

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

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

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

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