

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)

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

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

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

$$x_B = P_B / P_T \rightarrow n_B = x_B n_T \rightarrow n_B = 1,443$$

$$x_C = P_C / P_T \rightarrow n_C = x_C n_T \rightarrow n_C = 4,797$$

$$x_D = P_D / P_T \rightarrow n_D = x_D n_T \rightarrow n_D = 2,899$$

**7. PEC 18/19- Pregunta 10**