Clase 14 14 Septiembre 2021

Título de la nota 14/09/2021

Tabla 1. Recopilación de los cálculos realizados para la parte 1. Variables para las gráficas 1 y 2.

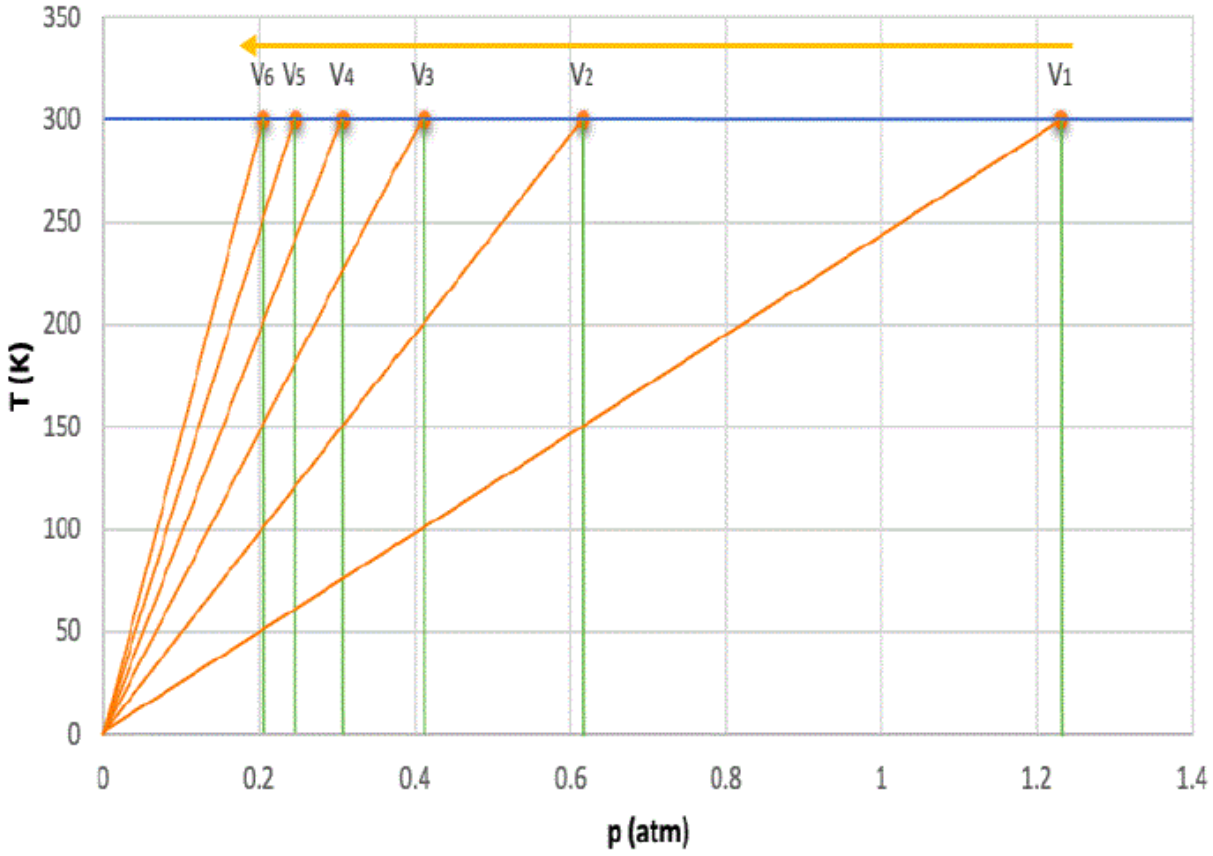
p (atm)	n (mol)	T (K)	V (L)
1.23	1	300	20
0.615	1	300	40
0.41	1	300	60
0.3075	1	300	80
0.246	1	300	100
0.205	1	300	120

$\frac{1.23}{0.615} = 2$

$\frac{20}{40} = \frac{1}{2}$

$T = f(p)$

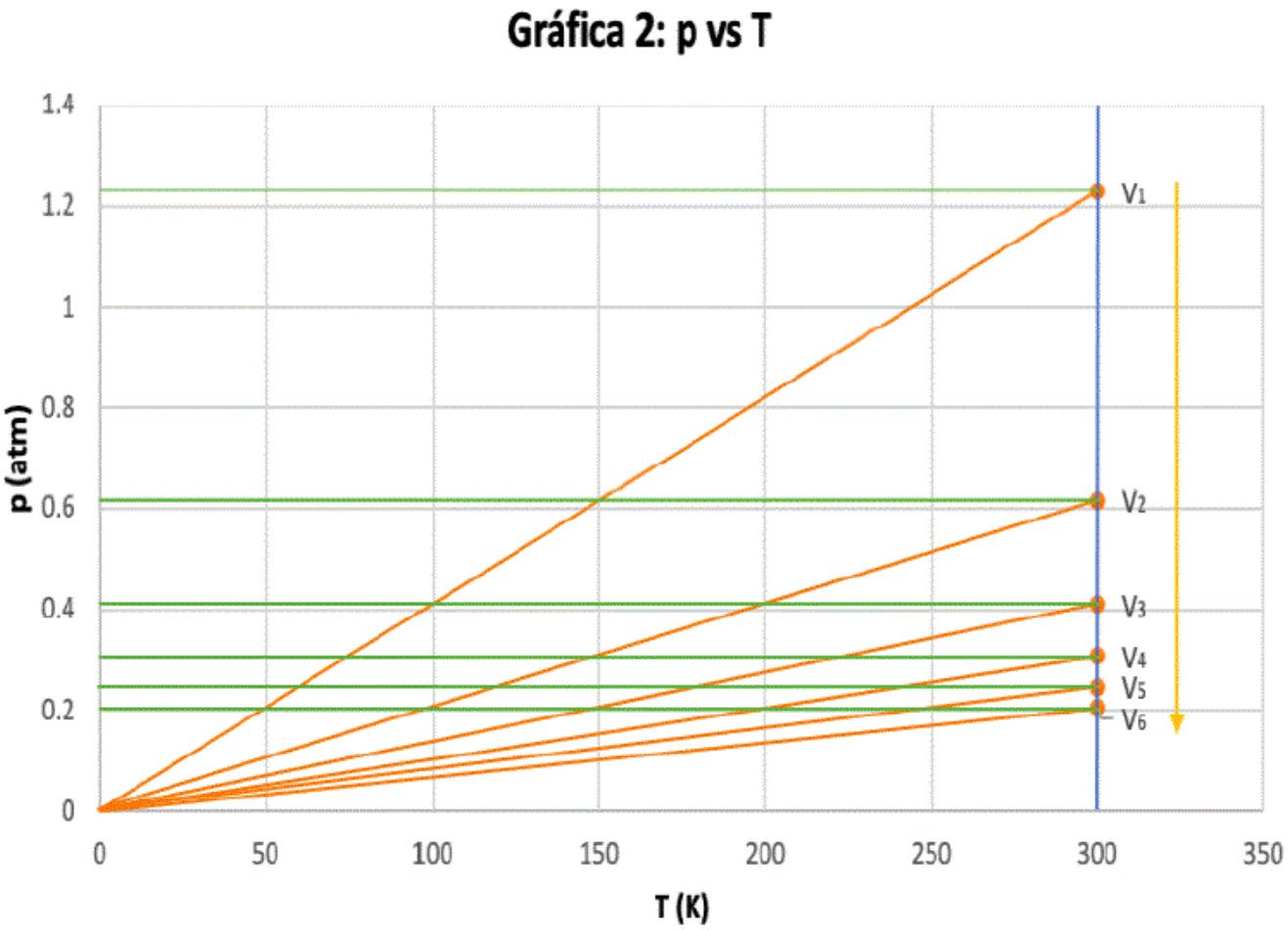
Gráfica 1: T vs p



$V_1 < V_2$

$V_1 < V_6$

expansión isotérmica



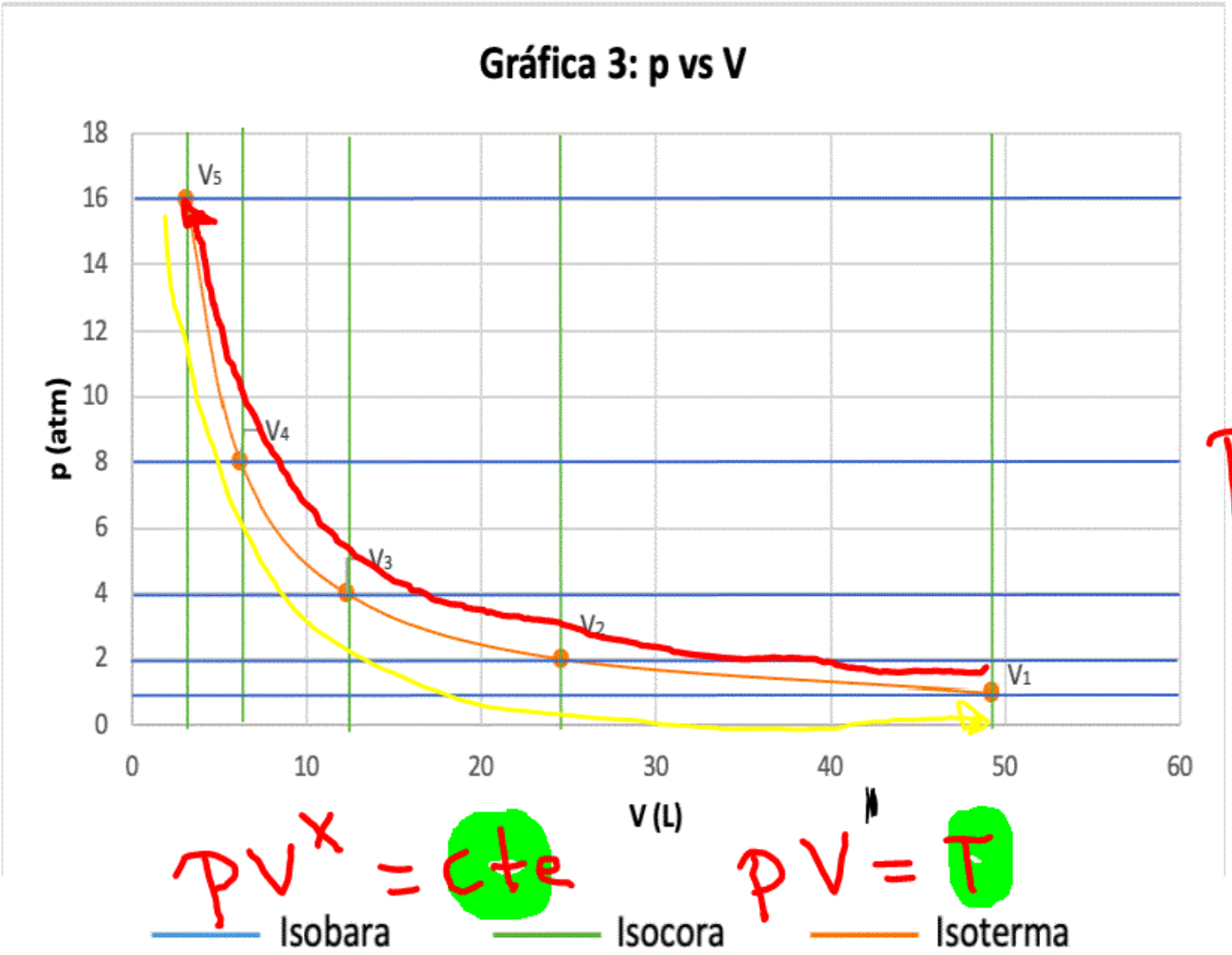
$V_6 > V_1$

expansión

Tabla 2. Recopilación de los cálculos realizados para la parte 2. Variables para las gráficas 3 y 4.

p (atm)	n (mol)	T (K)	V (L)
1	1	600	49.2
2	1	600	24.6
4	1	600	12.3
8	1	600	6.15
16	1	600	3.075

$pV^x = cte$ $x=1$ Isotérmico



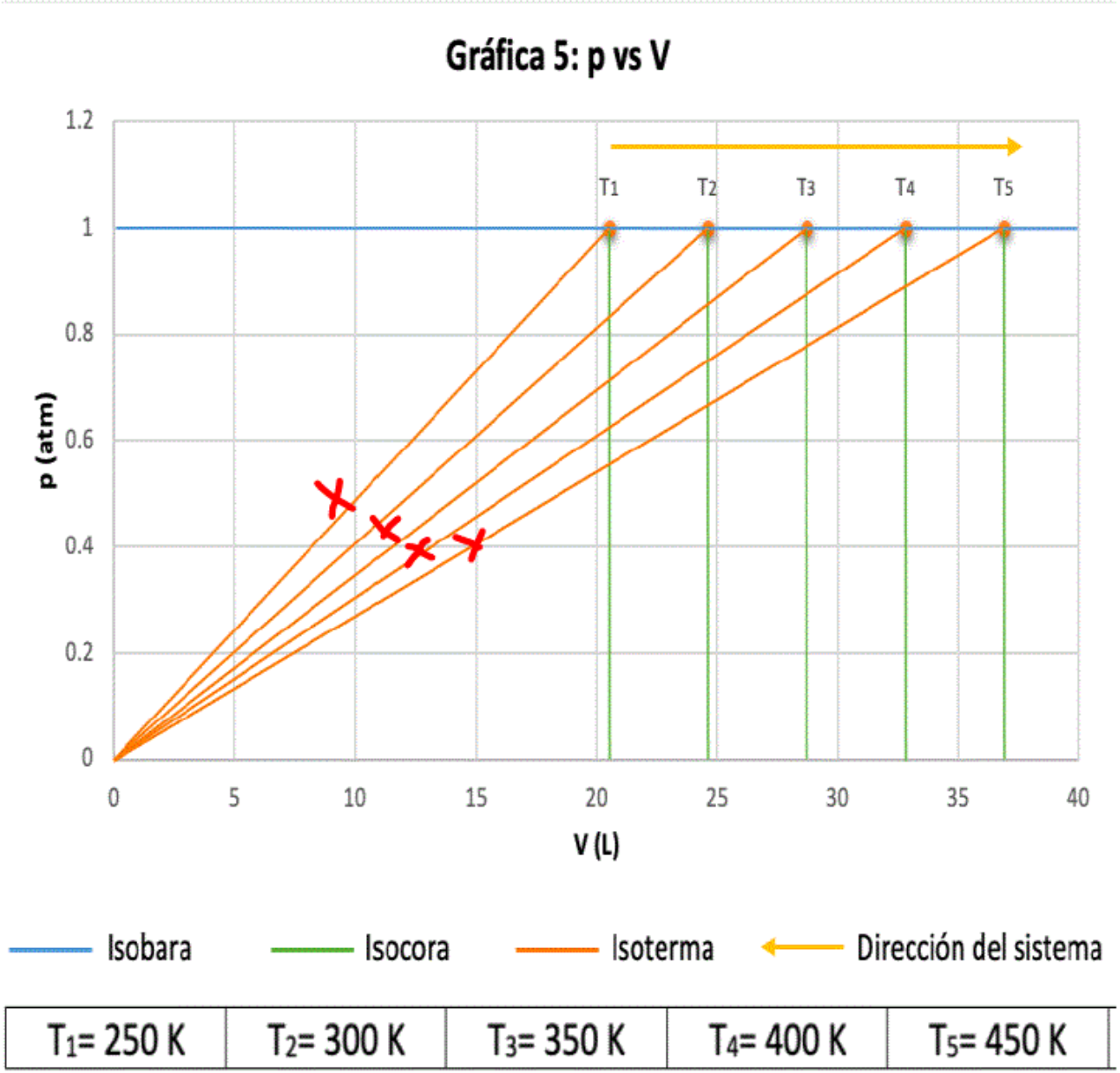
$pV^x = cte$

$pV = T$

$pV = nRT$ sistema cerrado

$p\bar{V} = RT$

V_1= 49.2 L	V_2= 24.6 L	V_3= 12.3 L	V_4= 6.15 L	V_5= 3.075 L



T_1= 250 K	T_2= 300 K	T_3= 350 K	T_4= 400 K	T_5= 450 K

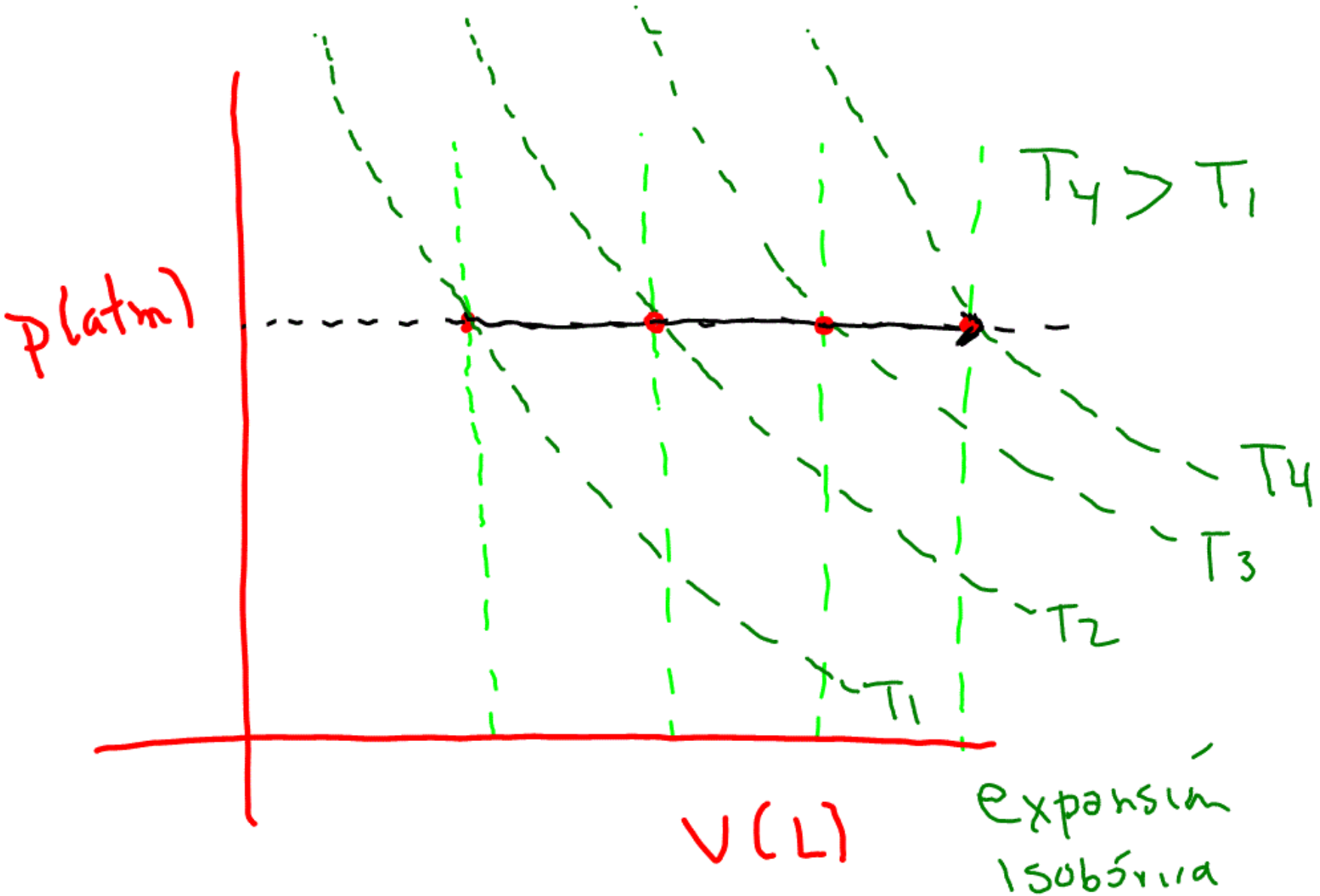

p(atm)
V(L)
$T_4 > T_1$
T_4
T_3
T_2
T_1
expansión
isobárica

Tabla 3: Recopilación de los cálculos realizados para la parte 3. Variables para las gráficas 5 y 6.

p (atm)	n (mol)	T (K)	V (L)
1	1	250	20.5
1	1	300	24.6
1	1	350	28.7
1	1	400	32.8
1	1	450	36.9

$\frac{300}{250} = 1.2$ $\frac{24.6}{20.5} = 1.2$

$$K = {}^{\circ}C + 273.15$$

1 atm

$0\,^{\circ}C$ ——— $100\,^{\circ}C$

$32\,^{\circ}F$ ——— $212\,^{\circ}F$

$$y = mx + b$$

$$y = {}^{\circ}F \qquad X = {}^{\circ}C$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$${}^{\circ}F = m\,{}^{\circ}C + b$$

$${}^{\circ}F = \left(\frac{212\,{}^{\circ}F - 32\,{}^{\circ}F}{100\,{}^{\circ}C - 0\,{}^{\circ}C}\right){}^{\circ}C + b$$

$${}^{\circ}F = \left(\frac{180\,{}^{\circ}F}{100\,{}^{\circ}C}\right){}^{\circ}C + b$$

$$°F = \left(\frac{9\,°F}{5\,°C}\right)°C + b$$

$$32°F = \left(\frac{9\,°F}{5\,°C}\right)(0\,°C) + b$$

$$b = 32°F$$

$$°F = \left(\frac{9\,°F}{5\,°C}\right)(°C) + 32°F$$

$$^{o}F = \frac{9}{5}\,^{o}C + 32$$ X

Funciones estado { ΔU, ΔH, ΔS, ΔG, ΔA

$$\bar{C}_p - \bar{C}_v = R$$

$$\bar{C}_p = \bar{C}_v + R$$

$$\Delta U = n \bar{C}_v \Delta T$$

$$pV = nRT$$

$$\Delta pV = nR\Delta T$$ sistema cerrado

$$\Delta H = \Delta U + \Delta pV$$

$$\Delta H = \Delta U + nR\Delta T$$

$$\Delta H = n\bar{C}_V\Delta T + nR\Delta T$$

$$\Delta H = n\Delta T(\bar{C}_V + R)$$

$$\boxed{\Delta H = n\bar{C}_P\Delta T}$$

$$\Delta U = n\bar{C}_v \Delta T$$

$$dU = n\bar{C}_v dT$$

$$\Delta H = n\bar{C}_p \Delta T$$

$$dH = n\bar{C}_p dT$$

Isotérmico

$$\Delta U = 0$$

$$\Delta H = 0$$

$$\Delta T = 0$$

Entropía 2 da Ley Termodinámica

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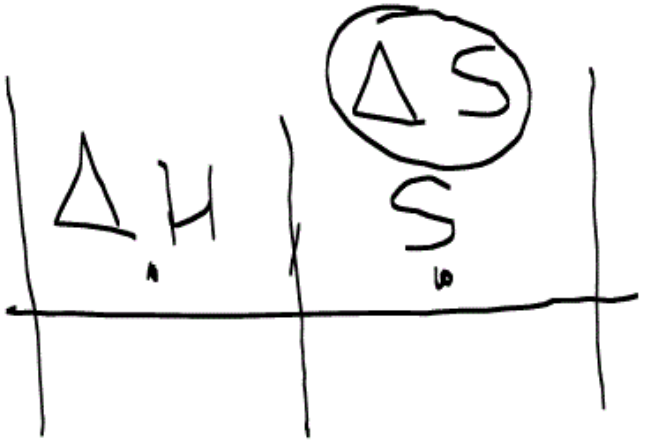
Probabilidad de choque molecular

grado de desorden

Entropía (S)



$$\Delta S_U = \Delta S_{SIST} + \Delta S_{Alr}$$

$$\Delta S_U > 0$$

Entropía Absoluta

$$\Delta S = S_2 - S_1$$

S_1 = Ref 0K $S_1 = 0$

cristal perfecto

Lewis-Randall 3ra Ley Termodinámica


Funciones
Trayectoria
q
Δq
dq
w
Δw
dw
Rev.
Irrev.
multipasos
1 solo paso

$$\Delta U = q - w$$

Isotérmico

$$\Delta U = 0$$

$$q = w$$

ideal
o perfecto