

Calor de Vaporización del Agua a partir de valores experimentales.

Prof.: Dr. Juan Ignacio Manassaldi

J.T.P.: Ing. Amalia Rueda

El valor del calor de vaporización de un compuesto puro se deduce de la relación de Clausius-Clapeyron.

$$\frac{dP}{dT} = \frac{\Delta H_{vap}}{T \Delta V_{vap}} \quad \text{Clapeyron}$$

$$\frac{dP}{dT} = \frac{\Delta H_{vap}}{T (V_v - V_l)} = \frac{\Delta H_{vap}}{T \left(\frac{Z_v RT}{P} - \frac{Z_l RT}{P} \right)} = \frac{\Delta H_{vap}}{\frac{RT^2}{P} (Z_v - Z_l)}$$

$$\frac{dP}{dT} = \frac{P \Delta H_{vap}}{RT^2 (Z_v - Z_l)}$$

$$\frac{d \ln(P)}{dT} = \frac{\Delta H_{vap}}{RT^2}$$

Ecuación de Clausius – Clapeyron.

$$\frac{d \ln(P)}{dT} = \frac{\Delta H_{vap}}{RT^2} \quad \longrightarrow \quad \frac{d \ln(P)}{dT} T^2 = \frac{\Delta H_{vap}}{R} \quad \longrightarrow \quad \frac{d \ln(P)}{\frac{1}{T^2} dT} = \frac{\Delta H_{vap}}{R}$$

$$\longrightarrow \quad \frac{d \ln(P)}{-d \frac{1}{T}} = \frac{\Delta H_{vap}}{R}$$

$$\frac{d \ln(P)}{d \frac{1}{T}} = - \frac{\Delta H_{vap}}{R}$$

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$$R_{H_2O} = 0.461526 \text{ kJ/(kg K)}$$

T [K]	P [bar]
298.1437	0.031686
313.1398	0.073813
323.1371	0.123446
333.1344	0.19933
343.1318	0.31177
353.1292	0.473752
373.1244	1.01325

STIMSON (1969)

T [K]	P [bar]	ln(P)	(1/T)
298.1437	0.031686	-3.45188034	3.354087e-03
313.1398	0.073813	-2.60622041	3.193462e-03
323.1371	0.123446	-2.09195147	3.094662e-03
333.1344	0.19933	-1.61279354	3.001791e-03
343.1318	0.31177	-1.16548954	2.914332e-03
353.1292	0.473752	-0.7470713	2.831825e-03
373.1244	1.01325	0.01316299	2.680071e-03

ΔH [kJ/kg]	ΔH [kJ/kg] (IPWS)	Error %
2429.83901	2441.721	0.49%
2419.35437	2406.026	0.55%
2392.08775	2382.005	0.42%
2371.13699	2357.729	0.57%
2350.77353	2333.126	0.76%
2322.10828	2308.118	0.61%
2312.09222	2256.54	2.46%