

Answer on Question #57282 – Chemistry – General chemistry

Question

In butane properties is that at 20 C & it's vapour pressure (absolute pressure) 220 kPa similarly, at 40 C is 360 kPa, at 45C is 385 kPa & 55C is 580 kPa. How they calculate these pressure on given temp

Answer

We may calculate these pressure on given temp from the Clausius-Clapeyron equation.

$$\ln \frac{P_1}{P_2} = \frac{\Delta H_{vap}}{R} \left(\frac{1}{T_2} - \frac{1}{T_1} \right)$$

$$\ln(P_1/P_2) = (\Delta H_{vap}/R)((1/T_2) - (1/T_1))$$

Where:

P1 – vapor pressure at the temperature T1

P2 – vapor pressure at the temperature T2

ΔH_{vap} – cas constant

T1 is temperature at which the vapor pressure is known

T2 is temperature at which the vapor pressure is to be found.