#64545 Chemistry, General Chemistry

Using heat formations, calculate the heat of vaporization for methyl alcohol, CH_3OH, at 25 Celsius (answer:38 kj/mol).

How many kJ's are required to vaporize 28.6 g CH_3OH at standard conditions (answer:33.9 kj/mol).

Answer:

$q = h_e \cdot n$
where
h_e = evaporation heat (kJ/mol)
n = moles of liquid (mol)
Assuming that m (CH_3OH) is equivalent to 1 mole, q = he ≈ 38 kJ/mol

Methanol (l) → Methanol (g)
Methanol (CH_3OH_{liq}) = -75.5 kj/mol
and Methanol (CH_3OH_{vap}) = - 38 kj/mol
M (CH_3OH)=32.04 g/mol
n=m/M n (CH_3OH)=28.6/38=0.75 mol
Heat of vaporisation deta H = deta Hproduct - delta H reactant
= - 38 -(- 83.2) = 45.2 kj/mol
Heat of vaporisation of methanol = 45.2 · 0.75 = 33.9 kJ