AP Chemistry – Quiz 10 PRACTICE

1. Consider the following skeletal reaction which occurs under standard thermodynamic conditions...

$2\ CH_3OH\ (l) + 3\ O_2\ (g) \rightarrow 2\ CO_2\ (g) + 4\ H_2O\ (l)$

a) Use standard enthalpy tables to determine $\Delta H°$ for this reaction.

b) Use standard entropy values to determine $\Delta S°$ for this reaction.

c) Determine ΔG for this reaction at 298 K. Is the reaction spontaneous or not at this temperature?

d) Using only the data above and the numbers on the board find the $\Delta G°$ value of CH_3OH (l).

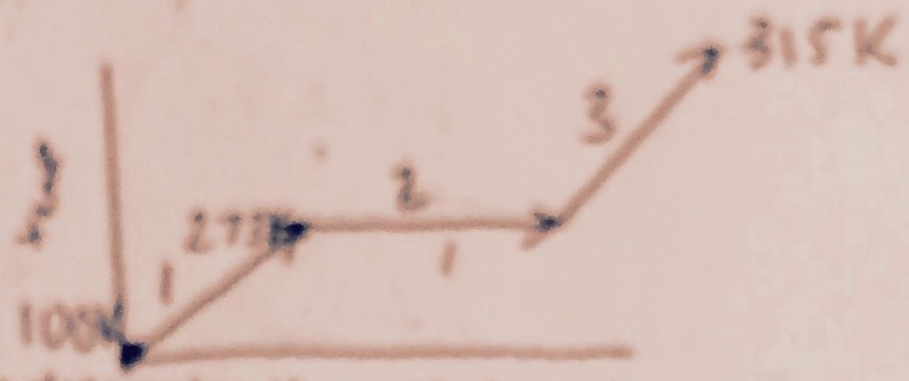
2. How much heat energy is required (at constant pressure) to convert 50g of ice at 100K to liquid water at 315K given the following data:

$C_{water} = 4.18$ J/gK

$C_{ice} = 2.1$ J/gK

$\Delta H_{fusion} = 6.01$ kJ/mol

$\Delta H_{vaporization} = 40.6$ kJ/mol



Hess's Law

3. Use the equations shown below to determine the enthalpy of the following: $H_2S\ (g) + 2\ O_2\ (g) \rightarrow H_2SO_4\ (l)$

$H_2S\ (g) + 2\ O_2\ (g) \rightarrow SO_3\ (g) + H_2O\ (l)$ $\Delta H = -690$ kJ

$H_2SO_4\ (l) \rightarrow SO_3\ (g) + H_2O\ (g)$ $\Delta H = 205$ kJ

$H_2O\ (g) \rightarrow H_2O\ (l)$ $\Delta H = -41$ kJ

$SO_3\ (g) + H_2O_{(g)} \rightarrow H_2SO_4$: -205 kJ

$H_2O \rightarrow H_2O_{(g)}$: 41 kJ

1. Enthalpy Tables

Formula	State	Enthalpy (kJ/mol)	Entropy (J/molK)	Gibbs Free Energy (kJ/mol)
CH_3OH	(g)	-201.08	239.70	-162.42
CH_3OH	(l)	-239.03	127.23	???
CO_2	(g)	-393.50	213.67	-394.39
H_2O	(l)	-285.83	69.91	-237.18
O_2	(g)	0	205.03	0