



المجموعة:

الاسم:

(Ag =108, Kr=84, C=12, N=14, O =16, and H=1)

Answer the following questions:

أجب عن الأسئلة الآتية:

(1): List two conditions under which deviations from ideal behaviour are observed. Give two reasons for such deviations (3)

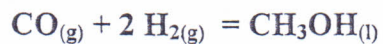
(2): When silver oxide is heated, it decomposes according to the reaction:  $2 Ag_2O_{(s)} \longrightarrow 4Ag_{(s)} + O_{2(g)}$   
If 5.76 gm of  $Ag_2O$  is heated and the  $O_2$  gas produced by the reaction is collected in an evacuated flask, what is the pressure of the  $O_2$  gas if the volume of the flask is  $650\text{ cm}^3$  and the gas temperature is  $25^\circ\text{C}$ ? (4)

(3): A gaseous mixture of oxygen ( $O_2$ ) and krypton (Kr) has a density of  $1.104\text{ g/l}$  at  $435\text{ tor.}$  and  $300\text{K}$ . Calculate the mole percent  $O_2$  in the mixture? (5)

(4): Derive the relationship between enthalpy change and the heat exchanged in a process carried out isobarically.? (2)

(5): The information in the table is at 25°C:

(a) Calculate  $\Delta H^\circ_r$  at 25°C for the reaction:



(b) Calculate  $\Delta H^\circ_f$  for  $\text{CH}_3\text{OH}_{(l)}$  at 25°C.

(c) Discuss the effect of temperature on the spontaneity of the reaction (5)

Compound	$\Delta H^\circ_f$ kcal/mole	$\Delta G^\circ_f$ kcal/mole	$S^\circ$ cal/mole K
$\text{H}_{2(g)}$	0.00	0.00	31.21
$\text{CO}_{(g)}$	-26.42	-32.81	47.30
$\text{CH}_3\text{OH}_{(l)}$	-----	-39.75	30.26

(6): Explain the concept of ideal solutions? (2)

(6): Compute the vapor pressure of a solution containing 34 gm of cane sugar, ( $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ ), in 500 gm of water at 30°C (consider  $P^\circ_{\text{H}_2\text{O}}$  at 30 °C = 31.8 mmHg) (4)

(7): At 24 °C, 0.00178 gm.  $\text{N}_2$  gas will dissolve in 100 gm. of  $\text{H}_2\text{O}$ , if the nitrogen pressure is 737 torr. Calculate the Henry's law constant in the unit of (torr./mole fraction). (3)