CHEMISTRY QUESTIONS FOR CLAIM

PHYSICAL CHEMISTRY

09-01-2019_1ST SHIFT

5. 0.5 moles of gas A and x moles of gas B exert a pressure of 200 Pa in a container of volume 10 m^3 at 1000 K. Given R is the gas constant in $JK^{-1}mol^{-1}$, x is :

(1) $\frac{2R}{4-R}$ (2) $\frac{4+R}{2R}$ (3) $\frac{4-R}{2R}$ (4) $\frac{2R}{4+R}$

Ans. (3)

Sol. PV = nRT

$$200\frac{N}{m^2}\times 10m^3 = (0.5+x)\times R\times 1000$$

$$0.5+x=\frac{2}{R};\ x=\frac{4-R}{2R}$$

23. For emission line of atomic hydrogen from $n_i = 8 \text{ to } n_f = n$, the plot of wave number ($\bar{\nu}$) against $\left(\frac{1}{n^2}\right)$ will be (The Rydberg constant, R_H is in wave number unit)

(1) Linear with intercept $-R_H$ (2) Non linear

(3) Linear with slope R_H (4) Linear with slope $-R_H$

Ans. (3)

Sol. $\because \quad \bar{\nu} = R_H \cdot Z^2\left(\frac{1}{n_1^2}-\frac{1}{n_2^2}\right)$

$$= R_H \cdot 1^2\left(\frac{1}{n_f^2}-\frac{1}{8^2}\right)$$

$$\bar{\nu} = \frac{R_H}{n_f^2}-\frac{R_H}{64}$$

Linear with slope R_H.

PHYSICAL CHEMISTRY

11-01-2019_1st SHIFT

23. For the cell $Zn(s)|Zn^{2+}(aq)||M^{x+}(aq)|M(s)$, different half cells and their standard electrode potentials are given below :

$M^{x+}(aq)/M(s)$	$Au^{3+}(aq)/Au(s)$	$Ag^{+}(aq)/Ag(s)$	$Fe^{3+}(aq)/Fe^{2-}(aq)$	$Fe^{2+}(aq)/Fe(s)$
$E^{\circ}_{M^{x+}/M^{(s)}}$	1.40	0.80	0.77	−0.44

If, $E^{\circ}_{Zn^{2+}/Zn} = -0.76V$, which cathode will give a maximum value of E_{cell} per electron transferred?

(1) Fe^{3+}/Fe^{2+} (2) Au^{3+}/Au (3) Ag^{+}/Ag (4) Fe^{2+}/Fe

Ans. (1)

Sol. $E^{o}_{cell} = E^{o}_{Au^{+3}|Au(s)} - E^{o}_{Zn^{+2}|Zn(s)}$

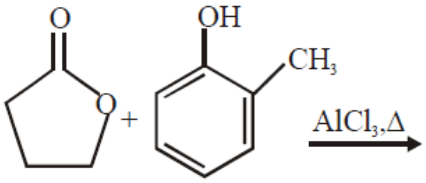
= 1.4 V – (–0.76 V) = 2.16 V

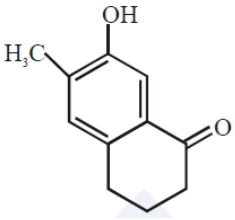
E^{o}_{cell} is maximum with $E^{o}_{Au^{+3}|Au(s)}$ and E^{o}_{cell} is intensive property so does not depend on number of electron transferred in cell reaction.

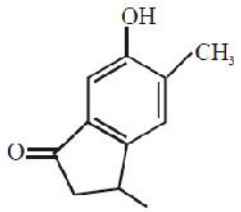
ORGANIC CHEMISTRY

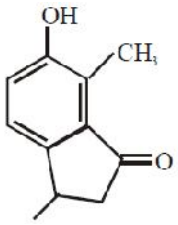
09-01-2019_2ND SHIFT

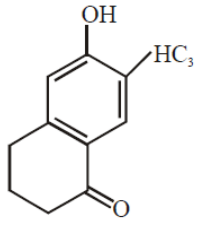
18. The major product of the following reaction is :



(1) 

(2) 

(3) 

(4) 

Ans. (3)

Sol.