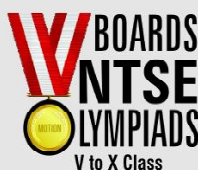


हमारा विश्वास... हर एक विद्यार्थी है खास

**JEE  
MAIN  
Sept.  
2020**

**QUESTION PAPER WITH SOLUTION**

**CHEMISTRY \_ 3 Sep. \_ SHIFT - 1**



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1. It is true that :

- (1) A second order reaction is always a multistep reaction
- (2) A first order reaction is always a single step reaction
- (3) A zero order reaction is a multistep reaction
- (4) A zero order reaction is a single step reaction

यह सत्य है कि:

- (1) एक द्वितीय कोटि की अभिक्रिया सदैव एक बहुपदीय अभिक्रिया है।
- (2) एक प्रथम कोटि की अभिक्रिया सदैव एक एकल पद अभिक्रिया है।
- (3) एक शून्य कोटि अभिक्रिया एक बहुपदीय अभिक्रिया है।
- (4) एक शून्य कोटि अभिक्रिया एक एकल पद अभिक्रिया है।

Sol. 3

**Factual**

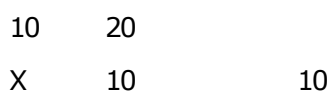
2. An acidic buffer is obtained on mixing :

- (1) 100 mL of 0.1 M HCl and 200 mL of 0.1 M CH<sub>3</sub>COONa
- (2) 100 mL of 0.1 M HCl and 200 mL of 0.1 M NaCl
- (3) 100 mL of 0.1 M CH<sub>3</sub>COOH and 100 mL of 0.1 M NaOH
- (4) 100 mL of 0.1 M CH<sub>3</sub>COOH and 200 mL of 0.1 M NaOH

एक अम्लीय बफर इनके मिलाने से प्राप्त होता है :

- (1) 100 mL 0.1 M HCl तथा 200 mL 0.1 M CH<sub>3</sub>COONa
- (2) 100 mL 0.1 M HCl तथा 200 mL 0.1 M NaCl
- (3) 100 mL 0.1 M CH<sub>3</sub>COOH तथा 100 mL 0.1 M NaOH
- (4) 100 mL 0.1 M CH<sub>3</sub>COOH तथा 200 mL 0.1 M NaOH

Sol. 1



Acidic buffer

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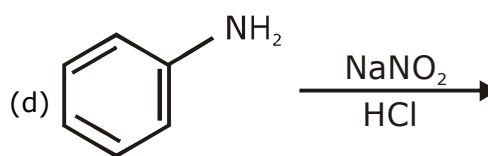
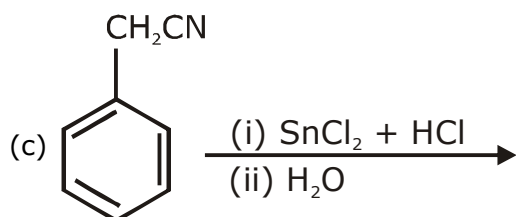
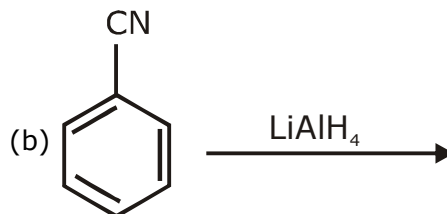
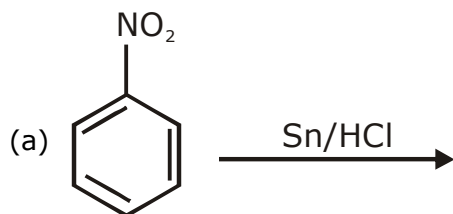
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3. The Kjeldahl method of Nitrogen estimation fails for which of the following reaction products?  
निम्नांकित किन अभिक्रिया उत्पादों के लिए नाइट्रोजन आकलन की केल्डाल (Kjeldahl) विधि असफल रहती है ?



(1) (a), (c) and (d)

(3) (c) and (d)

(1) (a), (c) तथा (d)

(3) (c) तथा (d)

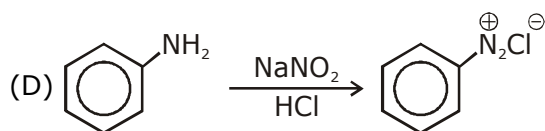
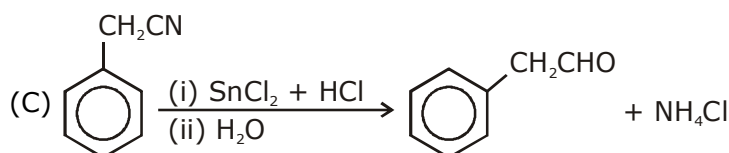
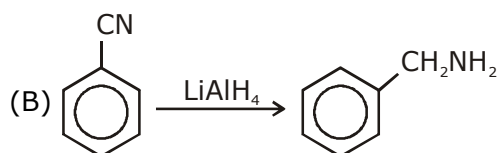
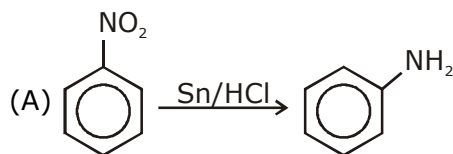
(2) (b) and (c)

(4) (a) and (d)

(2) (b) तथा (c)

(4) (a) तथा (d)

Sol. 3



Diazo compound and inorganic nitrogen can't be estimated by kjeldal method.

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4. If the boiling point of  $H_2O$  is 373 K, the boiling point of  $H_2S$  will be :

- (1) greater than 300 K but less than 373 K
- (2) equal to 373 K
- (3) more than 373 K
- (4) less than 300 K

यदि  $H_2O$  का क्वथनांक 373 K है तो  $H_2S$  का क्वथनांक होगा :

- (1) 300 K से ज्यादा परन्तु 373 K से कम
- (2) 373 K के बराबर
- (3) 373 K से ज्यादा
- (4) 300 K से कम

Sol. 4

Less than 300 K (factual)

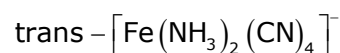
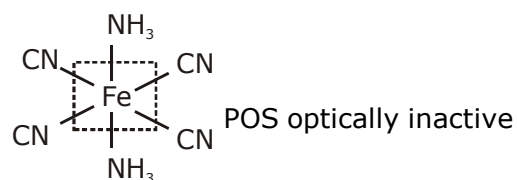
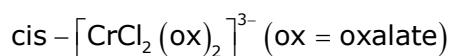
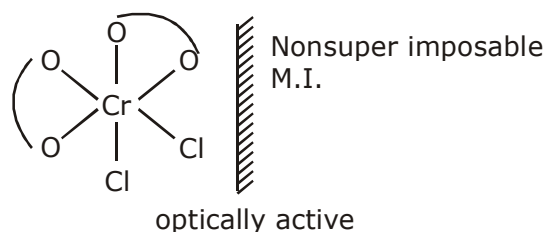
5. The complex that can show optical activity is :

- (1)  $cis - [CrCl_2(ox)_2]^{3-}$  (ox = oxalate)
- (2)  $trans - [Fe(NH_3)_2(CN)_4]^-$
- (3)  $trans - [Cr(Cl_2)(ox)_2]^{3-}$
- (4)  $cis - [Fe(NH_3)_2(CN)_4]^-$

वह संकर जो ध्रुवण धूर्णकता प्रदर्शित कर सकता है, होगा:

- (1) सिस -  $[CrCl_2(ox)_2]^{3-}$  (ox = oxalate)
- (2) ट्रांस -  $[Fe(NH_3)_2(CN)_4]^-$
- (3) ट्रांस -  $[Cr(Cl_2)(ox)_2]^{3-}$
- (4) सिस -  $[Fe(NH_3)_2(CN)_4]^-$

Sol. 1



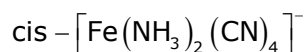
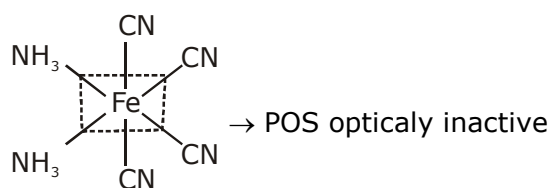
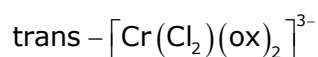
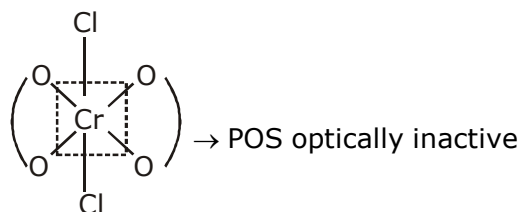
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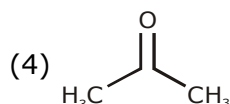
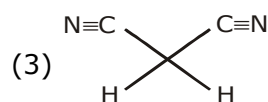
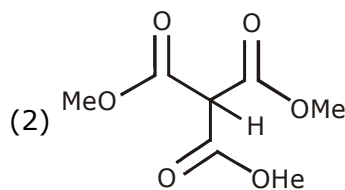
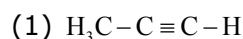
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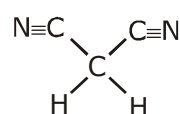


6. Which one of the following compounds possesses the most acidic hydrogen?

निम्न यौगिकों में से किस में सर्वाधिक अम्लीय हाइड्रोजन है ?



Sol. 3



has most acidic hydrogen among given compound, this is due to strong -M effect of

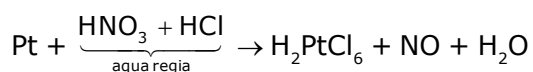
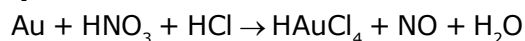
-CN group which stabilize -ve charge significantly.

7. Aqua regia is used for dissolving noble metals (Au, Pt, etc.). The gas evolved in this process is :

नोबल धातुओं (Au, Pt आदि) को धोलने के लिए एक्वा रेजिआ काम में लाई जाती है। इस प्रक्रम में निकलने वाली गैस है:

- (1)  $\text{N}_2\text{O}_3$                       (2)  $\text{N}_2$                       (3)  $\text{N}_2\text{O}_5$                       (4) NO

Sol. 4



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8. The antifertility drug "Novestrol" can react with :

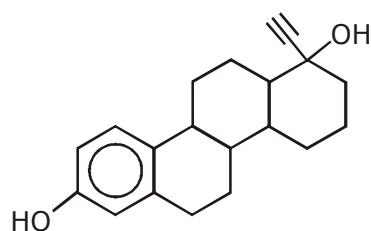
- (1)  $\text{Br}_2/\text{water}; \text{ZnCl}_2/\text{HCl}; \text{FeCl}_3$  (2)  $\text{Br}_2/\text{water}; \text{ZnCl}_2/\text{HCl}; \text{NaOCl}$   
 (3) Alcoholic HCN; NaOCl;  $\text{ZnCl}_2/\text{HCl}$  (4)  $\text{ZnCl}_2/\text{HCl}; \text{FeCl}_3$ ; Alcoholic HCN

प्रतिजनन औषध "नोवेस्ट्रॉल" जिनसे अभिक्रिया कर सकता है वे है:

- (1)  $\text{Br}_2/\text{जल}; \text{ZnCl}_2/\text{HCl}; \text{FeCl}_3$  (2)  $\text{Br}_2/\text{जल}; \text{ZnCl}_2/\text{HCl}; \text{NaOCl}$   
 (3) ऐल्कोहॉलिक HCN; NaOCl;  $\text{ZnCl}_2/\text{HCl}$  (4)  $\text{ZnCl}_2/\text{HCl}; \text{FeCl}_3$ ; ऐल्कोहॉलिक HCN

Sol. 1

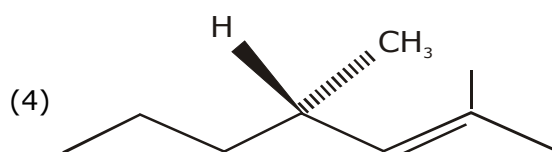
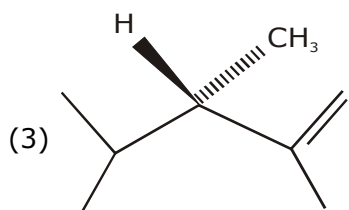
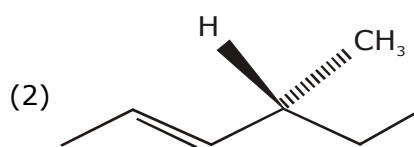
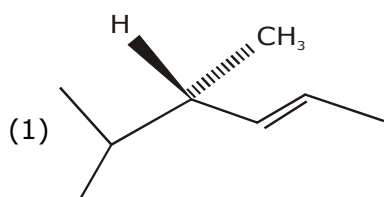
Novestrol



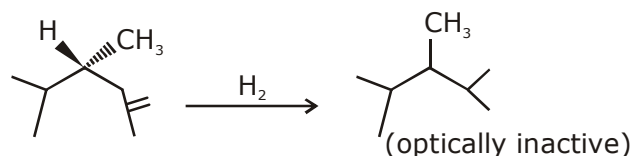
It can react with  $\text{Br}_2/\text{water}$  due to presence of unsaturation, with  $\text{ZnCl}_2/\text{HCl}$  due to  $-\text{OH}$  group and with  $\text{FeCl}_3$  due to phenol.

9. Which of the following compounds produces an optically inactive compound on hydrogenation?

हाइड्रोजनीकरण पर निम्न में से कौनसा यौगिक ध्रुवण अधूर्णक यौगिक उत्पन्न करता है ?



Sol. 3



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10. Of the species, NO, NO<sup>+</sup>, NO<sup>2+</sup> and NO<sup>-</sup>, the one with minimum bond strength is :  
 स्पीशीज NO, NO<sup>+</sup>, NO<sup>2+</sup> तथा NO<sup>-</sup> में, वह एक जिसकी आबन्ध सामर्थ्य अल्पतम है, होगी :

- (1) NO<sup>-</sup>                      (2) NO<sup>+</sup>                      (3) NO<sup>2+</sup>                      (4) NO

Sol. 1

B.O. NO<sup>-</sup> = 2  
 BO NO<sup>+</sup> = 3  
 BO NO<sup>2+</sup> = 2.5  
 BO NO = 2.5

$$B.O \propto \frac{1}{B.L}$$

11. Glycerol is separated in soap industries by :

- (1) Fractional distillation                      (2) Distillation under reduced pressure  
 (3) Differential extraction                      (4) Steam distillation

सोप उद्योग में ग्लिसरॉल निम्न में से किसके द्वारा पथक किया जाता है ?

- (1) प्रभाजी आसवन                      (2) कम दाब पर आसवन  
 (3) विभेदी निष्कर्षण                      (4) वाष्प आसवन

Sol. 2

conceptual

Glycerol is separated in soap industries by distillation under reduced pressure

12. Thermal power plants can lead to :

- (1) Ozone layer depletion                      (2) Blue baby syndrome  
 (3) Eutrophication                      (4) Acid rain

तापीय विद्युत संयंत्रों से यह हो सकता है:

- (1) ओजोन परत अवक्षय                      (2) ब्लू बेबी सिन्ड्रोम  
 (3) सुपोषण                      (4) अम्ल वर्षा

Sol. 4

Refer environmental chemistry

It emits CO<sub>2</sub> that combine with moisture of atmosphere and forms H<sub>2</sub>CO<sub>3</sub> (carbonic acid)

13. Henry's constant (in kbar) for four gases α, β, γ and δ in water at 298 K is given below :

	α	β	γ	δ
K <sub>H</sub>	50	2	2 × 10 <sup>-5</sup>	0.5

(density of water = 10<sup>3</sup> kg m<sup>-3</sup> at 298 K)

This table implies that :

- (1) solubility of γ at 308 K is lower than at 298 K  
 (2) The pressure of a 55.5 molal solution of δ is 250 bar  
 (3) α has the highest solubility in water at a given pressure  
 (4) The pressure of a 55.5 molal solution of γ is 1 bar

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298 K पर जल में चार गैसों  $\alpha$ ,  $\beta$ ,  $\gamma$  तथा  $\delta$  के लिए हेनरी स्थिरांक (kbar में) नीचे दिये गये हैं :

	$\alpha$	$\beta$	$\gamma$	$\delta$
$K_H$	50	2	$2 \times 10^{-5}$	0.5

(298 K पर पानी का घनत्व =  $10^3 \text{ kg m}^{-3}$ )

सारणी से तात्पर्य निकलता है कि :

- (1)  $\gamma$  की धुलनशीलता 308 K की तुलना में 298 K पर निम्नतर है।
- (2)  $\delta$  के एक 55.5 मोलल विलयन का दाब 250 bar है।
- (3) दिये हुए दाब पर  $\alpha$  की पानी में धुलनशीलता उच्चतम है।
- (4)  $\gamma$  के एक 55.5 मोलल विलयन का दाब 1 bar है।

**Sol. 1**

$p = K_H X$  mol fraction of gas in liquid.

On increasing temp, ' $K_H$ ' increases

Hence solubility  $\downarrow$

therefore, option 1

- 14.** The electronic spectrum of  $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$  shows a single broad peak with a maximum at  $20,300 \text{ cm}^{-1}$ . The crystal field stabilization energy (CFSE) of the complex ion, in  $\text{kJ mol}^{-1}$ , is :

(1  $\text{kJ mol}^{-1} = 83.7 \text{ cm}^{-1}$ )

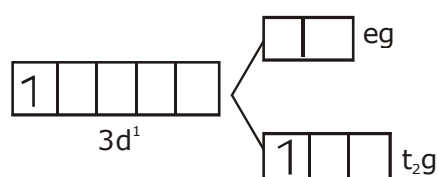
$[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$  का इलेक्ट्रॉनिक स्पेक्ट्रम एक विस्तृत पीक (ब्रॉड पीक) प्रदर्शित करता है जिसका उच्चतम  $20,300 \text{ cm}^{-1}$  पर है। संकुल की क्रिस्टल क्षेत्र स्थायीकरण ऊर्जा (CFSE) ( $\text{kJ mol}^{-1}$  में) होगी :

(1  $\text{kJ mol}^{-1} = 83.7 \text{ cm}^{-1}$ )

- (1) 83.7                      (2) 242.5                      (3) 145.5                      (4) 97

**Sol. 4**

$[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$   $\text{Ti}^{3+} 3d^1$  in octahedral field of ligend



$$\text{CFSE} = -0.4 \Delta_0$$

$$\text{CFSE} = \frac{-0.4 \times 20300}{83.7}$$

$$= 97 \text{ kJ mol}$$

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15. The atomic number of the element unnilennium is :

अननिलएनियम तत्व की परमाणु संख्या है:

(1) 109

(2) 102

(3) 119

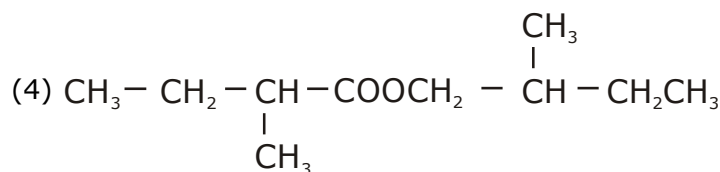
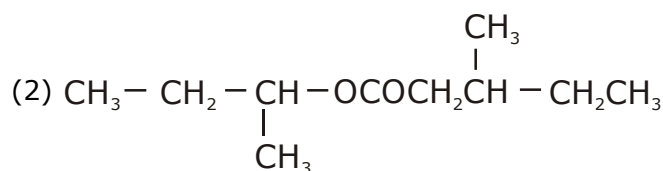
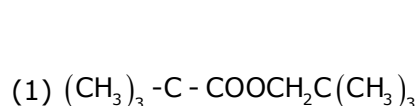
(4) 108

Sol. 1

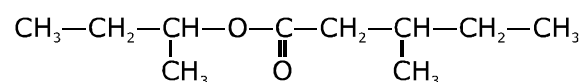
Unnilennium 109

16. An organic compound [A], molecular formula  $C_{10}H_{20}O_2$  was hydrolyzed with dilute sulphuric acid to give a carboxylic acid [B] and an alcohol [C]. Oxidation of [C] with  $CrO_3 - H_2SO_4$  produced [B]. Which of the following structures are not possible for [A]?

एक कार्बनिक यौगिक [A] जिसका अणुसूत्र  $C_{10}H_{20}O_2$  है। तनु सल्फ्यूरिक अम्ल के साथ जल अपघटित करने पर एक कार्बाक्सिलिक अम्ल [B] तथा एक ऐल्कोहॉल [C] देता है। [C] का  $CrO_3 - H_2SO_4$  के साथ ऑक्सीकरण [B] उत्पन्न किया। निम्न संरचनाओं में से कौन [A] के लिए संभव नहीं है ?

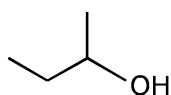


Sol. 2

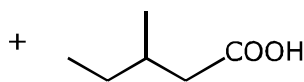


(A)

$\downarrow H_2O/H^+$

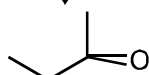


(C)



(B)

$\downarrow CrO_3 - H_2SO_4$



( $\neq B$ )

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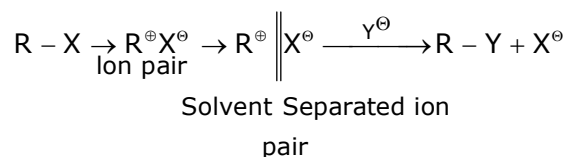
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17. The mechanism of  $S_N1$  reaction is given as :



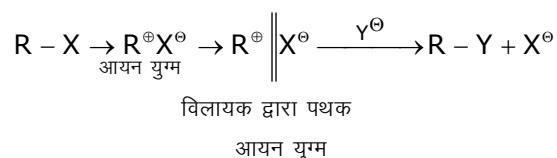
A student writes general characteristics based on the given mechanism as :

- (a) The reaction is favoured by weak nucleophiles.  
 (b)  $R^{\oplus}$  would be easily formed if the substituents are bulky.  
 (c) The reaction is accompanied by racemization.  
 (d) The reaction is favoured by non-polar solvents.

Which observations are correct?

- (1) (a) and (b) (2) (a), (b) and (c)  
 (3) (a) and (c) (4) (b) and (d)

$S_N1$  अभिक्रिया की क्रियाविधि इस प्रकार दी जाती है



दी हुई क्रियाविधि के आधार पर एक विद्यार्थी सामान्य गुण-धर्म इस प्रकार लिखता है :

- (a) अभिक्रिया दुर्बल नाभिकस्नेहियों से समर्थित होती है।  
 (b)  $R^{\oplus}$  आसानी से बन जायेंगे यदि प्रतिस्थापी स्थूल है।  
 (c) अभिक्रिया रेसिमीकरण के साथ होती है।  
 (d) अभिक्रिया अध्रुवी विलायकों द्वारा अनुकूल पड़ती है।

कौन-से प्रेक्षण सही हैं ?

- (1) (a) तथा (b) (2) (a), (b) तथा (c)  
 (3) (a) तथा (c) (4) (b) तथा (d)

Sol. 2

Statement (a), (b) & (c) are correct for  $S_N1$  reaction mechanism.

18. Tyndall effect is observed when:

- (1) The diameter of dispersed particles is much smaller than the wavelength of light used.  
 (2) The diameter of dispersed particles is much larger than the wavelength of light used.  
 (3) The refractive index of dispersed phase is greater than that of the dispersion medium.  
 (4) The diameter of dispersed particles is similar to the wavelength of light used.

टिन्डल प्रभाव तब प्रेक्षित किया जाता है जब:

- (1) प्रयुक्त प्रकाश के तरंगदैर्घ्य की तुलना में परिक्षिप्त कणों का व्यास बहुत छोटा हो।  
 (2) प्रयुक्त प्रकाश के तरंगदैर्घ्य की तुलना में परिक्षिप्त कणों का व्यास बहुत बड़ा हो।  
 (3) परिक्षेपण माध्यक की तुलना में परिक्षिप्त प्रावस्था का अपवर्तनांक अधिक हो।  
 (4) प्रयुक्त प्रकाश का तरंगदैर्घ्य परिक्षिप्त कणों के व्यास के ही समान हो।

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**Sol. 4**

Diameter of dispersed particles should not be much smaller than wavelength of light used.  
Refer topic surface chemistry

**19.** Let  $C_{\text{NaCl}}$  and  $C_{\text{BaSO}_4}$  be the conductances (in S) measured for saturated aqueous solutions of NaCl and BaSO<sub>4</sub>, respectively, at a temperature T. Which of the following is false?

- (1)  $C_{\text{NaCl}}(T_2) > C_{\text{NaCl}}(T_1)$  for  $T_2 > T_1$
- (2)  $C_{\text{BaSO}_4}(T_2) > C_{\text{BaSO}_4}(T_1)$  for  $T_2 > T_1$
- (3) Ionic mobilities of ions from both salts increase with T.
- (4)  $C_{\text{NaCl}} \gg C_{\text{BaSO}_4}$  at a given T

यदि ताप T पर, NaCl तथा BaSO<sub>4</sub> के संतप्त जलीय विलयन के लिए मापी गई चालकताएँ (S में)  $C_{\text{NaCl}}$  तथा  $C_{\text{BaSO}_4}$  हों तो निम्न में से कौन सा गलत है ?

- (1)  $C_{\text{NaCl}}(T_2) > C_{\text{NaCl}}(T_1)$ ,  $T_2 > T_1$  के लिए
- (2)  $C_{\text{BaSO}_4}(T_2) > C_{\text{BaSO}_4}(T_1)$  for  $T_2 > T_1$  के लिए
- (3) दोनों लवणों से आयनों की आयनिक गतिशीलताएँ T के साथ बढ़ती है
- (4)  $C_{\text{NaCl}} \gg C_{\text{BaSO}_4}$ , दिये गये ताप T पर

**Sol. 4**

Ionic

$C_{\text{NaCl}} \gg C_{\text{BaSO}_4}$  at temp 'T'

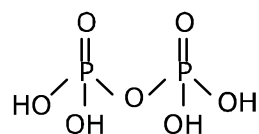
**20.** In a molecule of pyrophosphoric acid, the number of P-OH, P = O and P - O - P bonds/moiety(ies) respectively are :

- (1) 3, 3 and 3
- (2) 4, 2 and 1
- (3) 2, 4 and 1
- (4) 4, 2 and 0

पायराफास्फोरिक एसिड के अणु में P-OH, P = O तथा P - O - P आबन्धों / अर्धांश (अर्धांशों) की संख्या क्रमशः हैं :

- (1) 3, 3 तथा 3
- (2) 4, 2 तथा 1
- (3) 2, 4 तथा 1
- (4) 4, 2 तथा 0

**Sol. 2**



P - OH bonds = 4

P = O bonds = 2

P - O - P linkage = 1

Ans. 4, 2, 1

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**21.** The mole fraction of glucose ( $C_6H_{12}O_6$ ) in an aqueous binary solution is 0.1. The mass percentage of water in it, to the nearest integer, is \_\_\_\_\_.

एक जलीय द्विआधारी विलयन में ग्लूकोस ( $C_6H_{12}O_6$ ) का मोल प्रभांश (मोल फ्रैक्शन) 0.1 है। इसमें पानी की द्रव्यमान प्रतिशतता (निकटतम पूर्णांक), में होगी \_\_\_\_\_।

**Sol. 47 %**

$$X_{\text{Glucose}} = 0.1$$

$$\text{mass\% of glucose} = \frac{0.1 \times 180}{0.1 \times 180 + 0.9 \times 18} \times 100$$

$$= \frac{1800}{18 + 16.2}$$

$$= \frac{1800}{34.2} \%$$

$$= 52.63\%$$

$$= 53\%$$

$$\therefore \text{mass \% of } H_2O = 47\%$$

**22.** The volume strength of 8.9 M  $H_2O_2$  solution calculated at 273 K and 1 atm is \_\_\_\_\_. ( $R = 0.0821 \text{ L atm K}^{-1} \text{ mol}^{-1}$ ) (rounded off to the nearest integer)

273 K तथा 1 atm पर परिकलित 8.9 M  $H_2O_2$  विलयन की आयतन सामर्थ्य है \_\_\_\_\_

(निकटतम पूर्णांक में)

( $R = 0.0821 \text{ L atm K}^{-1} \text{ mol}^{-1}$ )

**Sol. 100**

$$\text{Vol. strength} = \frac{8.9}{2} \times \frac{0.821 \times 273}{1}$$

$$= 99.73$$

$$= 100$$

**23.** An element with molar mass  $2.7 \times 10^{-2} \text{ kg mol}^{-1}$  forms a cubic unit cell with edge length 405 pm. If its density is  $2.7 \times 10^3 \text{ kg m}^{-3}$ , the radius of the element is approximately \_\_\_\_\_  $\times 10^{-12} \text{ m}$  (to the nearest integer).

एक तत्व, जिसका मोलर द्रव्यमान  $2.7 \times 10^{-2} \text{ kg mol}^{-1}$  है, 405 pm कोर लम्बाई का एक घन एकक सेल बनाता है। यदि इसका (तत्व का) घनत्व  $2.7 \times 10^3 \text{ kg m}^{-3}$  है, तो तत्व की त्रिज्या लगभग होगी \_\_\_\_\_  $\times 10^{-12} \text{ m}$  (निकटतम पूर्णांक में)।

**Sol. 143**

$$\text{Density} = \frac{Z \times \text{GMM}}{N_A \times a^3}$$

$$2.7 \times 10^3 = \frac{Z \times 2.7 \times 10^{-2}}{6.023 \times 10^{23} \times (405 \times 10^{-12})^3}$$

$$Z = 6.023 \times 405 \times 405 \times 405 \times 10^{23-36+3+2}$$

$$Z = 6.023 \times 405 \times 405 \times 405 \times 10^{-8}$$

$$Z = 4$$

FCC

$$4R = \sqrt{2} \times a ; R = \frac{405}{2\sqrt{2}} \times 10^{-12} = 143.21 \times 10^{-12} \text{ m}$$

$$= 143 \text{ ans}$$

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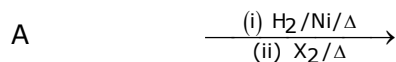
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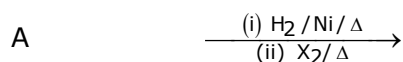
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24. The total number of monohalogenated organic products in the following (including stereoisomers) reaction is \_\_\_\_\_.



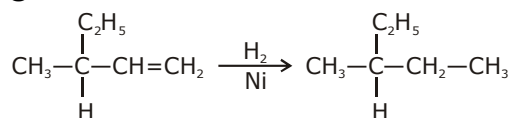
(Simplest optically active alkene)

निम्न अभिक्रिया में एकहैलोजनीकत कार्बनिक उत्पादों (त्रिविम समावयवियों को मिलाकर) की कुल संख्या होगी \_\_\_\_\_ ।

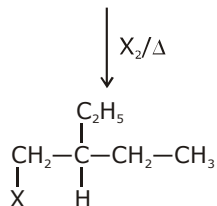


(एक सरलतम ध्रुवण घूर्णक एल्कीन)

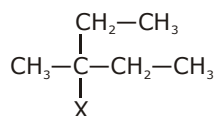
Sol. 8



(Simplest optically active alkene)

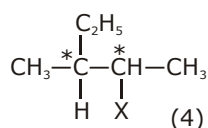


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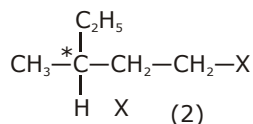


+

Total 8 organic products are possible



+



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25. The photoelectric current from Na (Work function,  $w_0 = 2.3 \text{ eV}$ ) is stopped by the output voltage of the cell  $\text{Pt(s)} | \text{H}_2(\text{g}, 1 \text{ Bar}) | \text{HCl}(\text{aq. pH} = 1) | \text{AgCl(s)} | \text{Ag(s)}$ .

The pH of aq. HCl required to stop the photoelectric current from K ( $w_0 = 2.25 \text{ eV}$ ), all other conditions remaining the same, is \_\_\_\_\_  $\times 10^{-2}$  (to the nearest integer).

Given,

$$2.303 \frac{RT}{F} = 0.06 \text{ V}; E_{\text{AgCl}|\text{Ag}|\text{Cl}^-}^0 = 0.22 \text{ V}$$

Na (कार्य फलन  $w_0 = 2.3 \text{ eV}$ ) से निकली प्रकाश विद्युत धारा सेल  $\text{Pt(s)} | \text{H}_2(\text{g}, 1 \text{ बार}) | \text{HCl}(\text{aq. pH} = 1) | \text{AgCl(s)} | \text{Ag(s)}$ .

से उत्पन्न वोल्टेज द्वारा रोक दी जाती है। यदि सभी शर्तें वही रहें, तो K ( $w_0 = 2.25 \text{ eV}$ ) से प्रकाश विद्युत धारा को रोकने के लिए HCl का pH होगा \_\_\_\_\_  $\times 10^{-2}$  (निकटतम पूर्णांक में)

दिया गया है,

$$2.303 \frac{RT}{F} = 0.06 \text{ V}; E_{\text{AgCl}|\text{Ag}|\text{Cl}^-}^0 = 0.22 \text{ V}$$

**Sol. 58**

Energy of photon =  $2.3 - E_{\text{cell}}$  {for Na}

Energy of photon =  $2.25 - E_{\text{cell}}$  {for K}

$E_{\text{cell}}$  {for 'Na'} + 0.05 =  $E_{\text{cell}}$  {for 'K'}

$$0.22 + 0.06 \log [\text{H}^+][\text{Cl}^-] + 0.05 = 0.22 + 0.06 \log [\text{H}^+][\text{Cl}^-]$$

$$6 \log (10^{-2}) + 5 = 6 \log [\text{H}^+][\text{Cl}^-]$$

$$\log (10^{-12}) + \log (10^5) = \log \{[\text{H}^+][\text{Cl}^-]\}^6$$

$$\{[\text{H}^+][\text{Cl}^-]\}^6 = 10^{-7}$$

$$[\text{H}^+]^{12} = 10^{-7}$$

$$\text{pH} = \frac{7}{12} = 0.58$$

$$= 58 \times 10^{-2} = 58 \text{ Ans}$$

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