CHEMISTRY

BOOKS - KVPY PREVIOUS YEAR

MOCK TEST 7

Exercise

1. One mole of calciium phosphide on reaction with excess water gives

A. one mole of phosphine

B. two moles of phosphoric acid

C. two moles of phosphine

D. one mole of phosphorus pentoxide

Answer:

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2. Coagulation value of the electrolytes $AlCl_3$ and NaCl for As_2S_3 sol are 0.093 and 52

respectively. How many times $AlCl_3$ has greater coagulating power than NaCl?

A. 930

B. 520

C. 560

D. None of these

Answer:

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3. The enthalpy of neutralisation of a weak acid in 1 M solution with a strong base is -56.1 kJ mol^{-1}/ If the enthalpy of ionization of the acid is 1.5 kJ mol^{-1} and enthalpy of neutralization of the strong acid with a strong base is -57.3 kJ equiv^{-1}, what is the % ionization of the weak acid in molar solution (assume the acid to be monobasic)?

A. 10

B. 15

C. 20

D. 25

Answer:

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4. A metal gives two chlorides 'A' and 'B'.'A' gives black precipitate with NH_4OH and 'B' gives white ppt. With KI 'B' gives a red precipitate soluble in excess of KI.'A' and 'B' are respectively :

A. Hg_2Cl_2 and $HgCl_2$

B. $HgCl_2$ and $ZnCl_2$

C. $ZnCl_2$ and Hg_2Cl_2

D. None of these

Answer:

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5. An alkyl halide with molecular formula $C_6H_{13}Br$ on dehyrohalogenation gives two isomeric alkenes X and Y with molecular formula C_6H_{12}. On reductive ozonolysis X and

Y gives four compounds CH_3COCH_3, CH_3CH_2CHO and $(CH_3)_2CHCHO$. The alkyl halide is

A. 2-bromohexane

B. 2, 2-dimethyl-1-bromobutane

C. 4-bromo-2-methylpentane

D. 3-bromo-2-methylpentane

Answer:

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6. The correct order of o^- bond lengths in ClO^-, ClO_2^-, ClO_3^- and ClO_4^- is

A. $ClO_4^- = ClO_3^- = ClO_2^- = ClO^-$

B. $ClO^- < ClO_2^- < ClO_3^- < ClO_4^-$

C. $ClO_4^- < ClO_3^- < ClO_2^- < ClO^-$

D. $ClO_3^- < ClO_4^- < ClO_2^- < ClO^-$

Answer:

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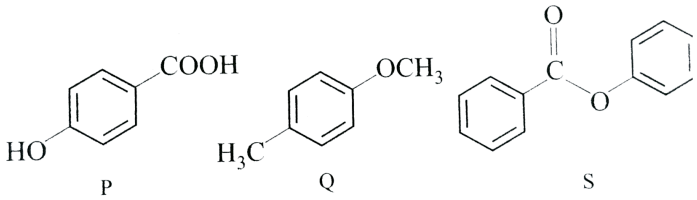
7. The compound P, Q and S

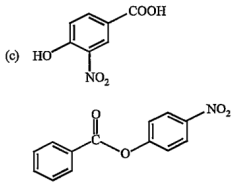


were separately subjected to nitration using HNO_3 / H_2SO_4mixture. The major product formed in each case respectively is

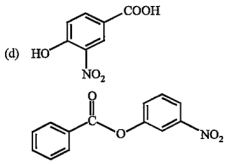
A.

B.

C.



D.



Answer:

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8. Which fo the following statements are correct concerning redox propreties ?

(i) The reducing power of hydrogen halides increases from hydrogen chloride to hydrogen iodide.

(ii) The oxidizing power of halogens decreases from chlorine to iodine.

(iii) A metal M for which $E^{\ominus}$ for the half-reaction

$M^{n+} + ne^{-} \Leftrightarrow M$

is very negative will be a good reducing agent.

A. (i),(ii) and(iii)

B. (i) and (ii)

C. (i) only

D. (ii) and (iii)

Answer:

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9. An 1% solution of $KCI(I), NaCI(II), BaCI_2(III)$ and urea (IV), have their osmotic pressure at the same

temperature in the ascending order (molar masses of $NaCI, KCI, BaCI_2$ and urea are respectively $58.5, 74.5, 208.4, 60 gmol^{-1}$ Assume 100% ionization of the electrolytes at this temperature

A. Ilt III ltII ltIV

B. IIIlt I ltII ltIV

C. IIIlt IV ltI ltII

D. Ilt III ltIV ltII

Answer:

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10. Given

(a) $n = 5, m_i = +1$ (b) $n = 2, l = 1, m_i = -1, m_s = -1/2$

The maximum number of electron(s) in an atom that can have the quanturm numbers as given in (a) and (b) are respectively:

A. 25 and 1

B. 8 and 1

C. 2 and 4

D. 4 and 1

Answer:

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11. A decapeptide (Mol. Wt. 769) on complete hydrolysis gives glycine (Mol. Wt. 75), alanine and phenylalanine.

Glycine contributes 47.0% to the total weight of the hydrolysed products. The number of glycine units. Present in the decapeptide is.

A. 3

B. 5

C. 6

D. 4

Answer:

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12. Amongst $LiCl$, $RbCl$, $BeCl_2$ and $MgCl_2$, the compounds whith the greatrest and the least ionic character respecitely are :

A. $LiCl$ and $RbCl$

B. $MgCl_2$ and $BeCl_2$

C. $RbCl$ and $BeCl_2$

D. $RbCl$ and $MgCl_2$

Answer:

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13. A monotomic ideal gas undergoes a process in which the ratio of p to V at any

instant is constant and equals to 1. what is the molar heat capacity of the gas?

A. $\frac{3R}{2}$

B. 2R

C. 0

D. $\frac{5R}{2}$

Answer:

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14. Which one of the following pairs of substances on reaction will not not evolve H_2 gas?

A. Iron and $H_2SO_4(aq)$

B. Iron and steam

C. Copper and HCI(g)

D. Sodium and ethyl alcohol

Answer:

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15. The elecron affinity of chlorine is $3.7eV$. How much energy in kcal is released when $2g$ chlorine is completely converted to cl^- ion in a gaseous state ?

$\left(1eV = 23.06kcal\text{mol}^{-10}\right)$.

A. 4.8 kcal

B. 7.2kcal

C. 8.2 kcal

D. 2.4kcal

Answer:

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16. A $\rightarrow$ B+ C is a first order reaction

Time	T	∞
Volume of reagent	V_2	V_3

Reagent reacts with all A, B and C and have 'n' factors in the ratio of 1 : 2 : 3 with the reagent. Find k.

A. $k = \frac{1}{t}\ln\left(\frac{n_2}{n_2 - n_1}\right)$

B. $k = \frac{1}{t}\ln\left(\frac{2n_2}{n_2 - n_1}\right)$

C. $k = \frac{1}{t}\ln\left(\frac{4n_2}{n_2 - n_1}\right)$

D. $k = \frac{1}{t}\ln\left(\frac{4n_2}{5(n_2 - n_1)}\right)$

Answer:

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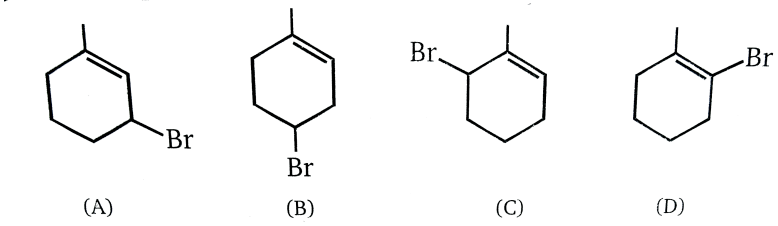
17. Among the given compound choose the two that yeild same carbocation on ionization



(A) (B) (C) (D)

A. A,C

B. B,D

C. A,B

D. B,C

Answer:

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18. Calculate the pH at the equivalence point when a solution of 0.01 M CH_3COOH is titrated with a solution of 0.01 M NaOH. pK_a of CH_3COOH is 4.74.

A. 10.50

B. 8.22

C. 7.52

D. 2.0

Answer:

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19. A salt which gives CO_2 with hot H_2SO_4 and also decolourises acidified $KMnO_4$ on warming is

A. bicarbonate

B. carbonate

C. oxalate

D. acetate

Answer:

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20. For the octahedral complexes of Fe^{3+} in SCN^- (thiocyanato -S) and in CN^- ligand environments, the difference between the spin

only magnetic moments in Bohr magnetons (when approximated to the nearest integer) is [atomic number of $Fe = 26$]

A. 4.2

B. 3.5

C. 2.5

D. 5.2

Answer:

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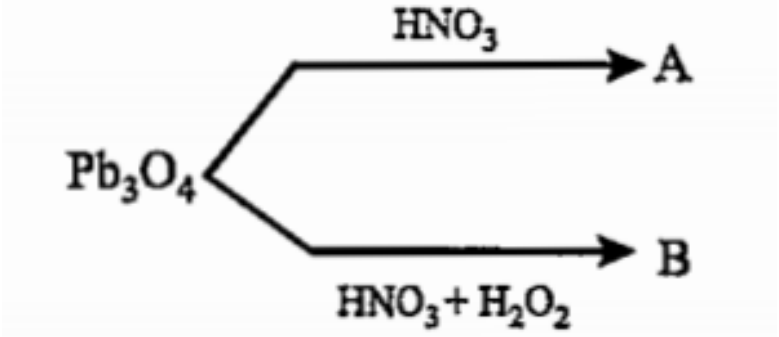
21. In the following reactions, the Pb compounds A and B are respectively.



A. $Pb(NO_3)_2 + PbO_2$ and $Pb(NO_3)_2$

B. $Pb(NO_3)_2$ and $Pb(NO_3)_2$

C. PbO_2 and $Pb(NO_3)_2$

D. $Pb(NO_3)_2$ and $PbO_2 + Pb(NO_3)_2$

Answer:

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22. Consider the cell $Ag|AgBr(s)Br^{-}||AgCl(s)Cl^{-}|Ag$ at 298 K the solubility product of AgCl and AgBr are 1×10^{-10} and 5×10^{-13} respectively. What should be the ratio of concentration of Br^{-} and Cl^{-} by which emf of the cell becomes zero?

A. 150/1

B. 1/150

C. 1/180

D. 1/200

Answer:

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23. The kinetic energy of an electron in the second Bohr orbit of a hydrogen atom is [a_0 is Bohr radius] :

A. $\frac{h^2}{4\pi^2 m a_0^2}$

B. $\frac{h^2}{16\pi^2 m a_0^2}$

C. $\frac{h^2}{32\pi^2 m a_0^2}$

D. $\frac{h^2}{64\pi^2 m a_0^2}$

Answer:

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24. Consider the following list of regents: Acidified $K_2Cr_2O_7$, alkaline $KMnO_4$, $CuSO_4$, H_2O_2, CI_2, O_3, HNO_3, and $Na_2S_2O_3$. The

total number of reagents that can oxidis aqueous I^{Θ} ion I_2 is

A. 1

B. 4

C. 2

D. 3

Answer:

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25. The degree of dissociation is 0.4 at $400K$ and 1.0 atm for the gaseous reaction

$PCl_5 \Leftrightarrow PCl_3 + Cl_2$

assuming ideal behaviour of all gases, calculate the density of equilibrium mixture at $400K$ and 1.0 atm (relative atomic mass of P is 31.0 and of Cl is 35.5).

A. 5.0

B. 4.5

C. 2.5

D. 3.5

Answer:

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26. Geometrical shapes of the complex formed by the reaction of Ni^{2+} with Cl^{Θ}, CN^{Θ} and H_2O are :

A. octahedral,tetrahedral and square planar

B. tetrahedral,square planar and octahedral

C. square planar, tetrahedral and octahedral

D. tetrahedral, octahedral and square planar

Answer:

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