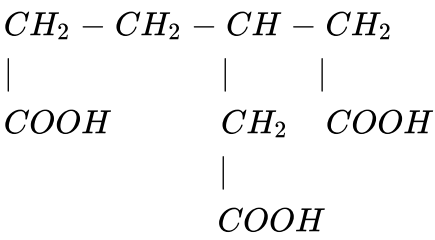
CHEMISTRY

BOOKS - BRILLIANT PUBLICATION

CARBOXYLIC ACIDS

Level I Homework

1. What is the IUPAC name of the following compound ?



A. Butan 1, 2, 4-Tricarbocylic acid

B. (3-carboxy methyl) hexane 1, 6-dioic acid

C. (4-carboxy methyl) pentane 1, 5-dioic acid

D. Heptane 1, 8-Dioic acid

Answer:

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2. Monocarboxylic acids are functional isomers of

A. Aldehydes

B. Ketones

C. Esters

D. Alcohols

Answer:

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3. Which of the following is optically inactive?

A. Lactic acid

B. Tartaric acid

C. Mandelic acid

D. Succinic acid

Answer:

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4. The kind of isomerism exhibited by maleic and fumaric acid is

A. optical

B. functional

C. geometrical

D. position

Answer:

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5. Which of the following does not contain a carboxyl group?

A. Tartaric acid

B. Adipic acid

C. Citric acid

D. Styphinic acid

Answer:

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6. Which of the following on oxidation by $KMnO_4$, does not given benzoic acid

A. Methyl benzene

B. Ethyl benzene .

C. Propyl benzene

D. Tert butyl benzene

Answer:

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7. Which one of the following reacts with grignard reagent to form an addition product which is hydrolysed to carboxylic acid

A. O_2

B. CO_2

C. SO_2

D. O_3

Answer:

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8. Which of the following orders is wrong with respect to the property indicated?

A. Formic acid $>$ acetic acid $>$ propanolc acid (acid strength)

B. Benzoic acid $>$ formic acid $>$ acetic acid (acid strength)

C. Cyclohexyl amine $>$ Aniline $>$ Acetamide (Base strength)

D.

$CH_3 - CH_2 - CH_2 - CH_2 - COOH < CH_3 - CH_3 - CH_2 - CH$

(melting point)

Answer:

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9. Carboxylic acid group can be easily tested by using

A. $NaHCO_3$

B. 2, 4-DNPH

C. NaOH

D. lodoform test

Answer:

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10. Action of formic acid on Tollen's reagent shows

A. Acidic nature of formic acid

B. basic nature of formic acid

C. formic acid is reducing agent

D. formic acid is an oxidisng agent

Answer:

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11. Which of the following does not undergo HVZ reaction

A. Propanoic acid

B. 2,2-Dimethyl propanoic acid

C. 2-methylpropanoic acid

D. All

Answer:

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12. Benzoic acid when heated with N_3H in presence of con. H_2SO_4 gives

A. Benzamide

B. Aniline

C. Benzyl amine

D. Phenyl isocyanate

Answer:

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13. n-Butyric acid on oxidation with mild oxidising agents like H_2O_2 produces

A. $CH_3 - CH_2 - COOH$

B. $CH_3 - \overset{\overset{O}{||}}{C} - CH_2COOH$

C. $CH_3 - CH_2 - \overset{\overset{O}{||}}{C} - COOH$

D. $CH_3 - \overset{\overset{OH}{|}}{C}H - CH_2 - COOH$

Answer:

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14. $R - CH_2 - OH$, $R - CHO$ and $R - COOH$ on reduction with red P and HI gives

A. $R - \overset{\overset{O}{||}}{C} - R$

B. $R - CH_3$

C. $R - O - R$

D. $R - \overset{\overset{O}{||}}{C} - O - \overset{\overset{O}{||}}{C} - R$

Answer:

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15. In the reaction sequence $A \xrightarrow{Ca(OH)_2} B \xrightarrow[\text{distilation}]{\text{dry}} \text{Acetone} \xrightarrow{\text{Conc.}H_2SO_4} C$. A, B and C are

A. $CH_3 - CHO$, aldol and phorone

B. $H - COOH$, CH_3CHO, CO_2

C. $CH_3 - COOH$, $(CH_3COO)_2Ca$, Mesitylene

D. $CH_3 - COOH$, $(CH_3COO)_2Ca$, Mesityl oxide

Answer:

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16. Which of the following is the suitable reagent to distinguish between carboxylic acid and phenol

A. PCl_6

B. $SOCl_2$

C. Na_2CO_3

D. $FeCl_3$

Answer:

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17. In the reaction sequence

$$CH \equiv CH \xrightarrow{A} \underset{\underset{CHO}{|}}{CH_3} \xrightarrow{B} \underset{\underset{COOH}{|}}{CH_3} \xrightarrow{C} CH_4$$

The reagents A, B and C are

A. $Hg^{2+} / H_2SO_4, H^+ / K_2Cr_2O_7, NaOH + CaO$

B. $BF_3 / HgO, SeO_2, P_2O_5$

C. $BH_3 / THF, H^+ / K_2Cr_2O_7 / NaOH + CaO$

D. $Cu_2Cl_2 / NH_4Cl, KMnO_4 / H^+, NaOH$

Answer:

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18. Benzoyl chloride is prepared from benzoic acid by

A. Cl_2/hv

B. SO_2Cl_2

C. $SOCl_2$

D. Cl_2 / H_2O

Answer:

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19. Which one of the following esters cannot undergo Claisen self condensation reaction ?

A. $CH_3 - CH_2 - CH_2 - COOC_2H_5$

B. $C_6H_5 - COOC_2H_5$

C. $C_6H_5 - CH_2 - COOC_2H_5$

D. $CH_3 - CH_2 - COOC_2H_5$

Answer:

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20. 59 g of amide obtained from the carboxylic acid R-COOH on heating with alkali gave 17 g NH_3. The acid is

A. H-COOH

B. $CH_3 - COOH$

C. $CH_3 - CH_2 - COOH$

D. C_6H_5COOH

Answer:

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21. The order of increasing ease of hydrolysis among derivative of carboxylic acid is

A.

$$CH_3 - CONH_2 < CH_3COOC_2H_5 < (CH_3CO)_2O < CH_3 - COCl$$

B.

$$CH_3COONH_2 < (CH_3 - CO)_2O < CH_3 - COOC_2H_5 < CH_3CO$$

C.

$$CH_3 - COCl < CH_3CONH_2 < (CH_3CO)_2O < CH_3COOC_2H_5$$

D. None of these

Answer:

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22. Decarboxylation occurs maximum in

A. CH_3COOH

B. $C_6H_5 - COOH$

C. $C_6H_5CH_2COOH$

D. $CH_3 - COCH_2COOH$

Answer:

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23. Consider the acidity of the carboxylic acids

 Which of the following order is correct?

A. $2 > 3 > 4 > 1$

B. $2 > 4 > 3 > 1$

C. $2 > 4 > 1 > 3$

D. $1 > 2 > 3 > 4$

Answer:

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24. Sodium salt of an organic acid 'X' produces effervesence with conc. H_2SO_4. X reacts with acidified aqueous $CaCl_2$ solution to give a white precipitate which decolourises acidified $KMnO_4$. 'X' is

A. HCOONa

B. CH_3COONa

C. $Na_2C_2O_4$

D. C_6H_5COONa

Answer:

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25. Rate of the reaction of fastest when 'Z' is

$$R-\overset{O}{\overset{||}{C}}-Z+Nu^- \rightarrow R-\overset{O}{\overset{||}{C}}-Nu+Z^-$$

A. $OCOCH_3$

B. NH_2

C. OC_2H_5

D. Cl^-

Answer:

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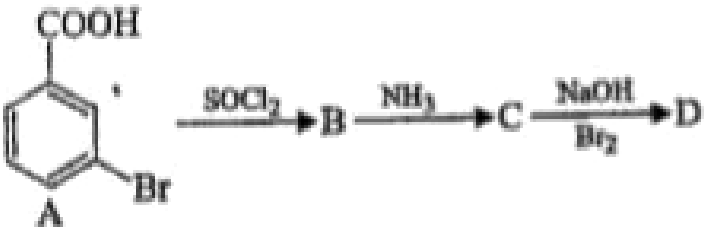
26. In a set of reactions, m-bromobenzoic acid gave a product D. Identify the product D.



A.

B.

C.

D.

Answer:

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27. Propanoic acid with Br_2 gives a dibromo product. It structure would be

A. $CH_3 - C(Br_2) - COOH$

B. $CH_3Br - CHBr - COOH$

C. $H - CBr_2 - CH_2 - COOH$

D. $CH_2Br - CH_2 - COBr$

Answer:

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28. $CH_3 - \underset{\underset{O}{||}}{C} - CH_2 - COOCH_3 \xrightarrow{Na(BH_4)}$. The product is

A. $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_2 - COOCH_3$

B. $CH_3\underset{\underset{OH}{|}}{CH} - CH_2 - CH_2 - OH$

C. $CH_3 - \underset{\underset{O}{||}}{C} - CH_2 - CH_2 - OH$

D. $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_2 - COOH$

Answer:

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29. Acetyl chloride reacts with grignard reagent to form

A. An aldehyde

B. Ketone

C. 3° alcohol

D. An ester

Answer:

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Level Ii

1. IUPAC name of Adipic acid is

A. Butane -1, 4-dioic acid

B. Pentane -1, 5-dioic acid

C. Hexane -1, 6-dioic acid

D. Butane-1, 4-dicarboxylic acid

Answer:

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2. A hydrocarbon C_6H_{12} decolourises bromine and gives n-Hexane on hydrogenation. On oxidation with $KMnO_4$ it forms two different monobasic acids of the type R-COOH. The compound is

A. Cyclohexene

B. 2-Hexene

C. 1-Hexene

D. 3-Hexene

Answer:

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3. Which is 'C' in the following reaction

$$HC \equiv CH \xrightarrow[CH_3I]{NaNH_2} A \xrightarrow[40\%\, H_2SO_4]{\%\, HgSO_4} B \xrightarrow[(2)\, H^+]{(1)\, NaOH\,/\,I_2} C$$

A. $CH_3 - CH_2 - CH_2 - CHO$

B. $CH_3 - CH_2 - \overset{\overset{O}{||}}{C} - CH_3$

C. $CH_3 - COOH$

D. $CH_3 - CH_2 - CH_2 - COOH$

Answer:

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4. Which of the following is the correct statement

A. Saliciylic acid is more acidic than 2, 6-dihydroxy benzoic acid

B. o-nitrobenzoic acid is a stronger acid than 3, 5-dinitrobenzoic acid

C. Propanamide is more basic than propylamine

D. The rate of Hofmann degradation of benzamideis greater than that of p-methoxy benzamide

Answer:

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5. In the following reaction the compound 'D' is

$\xrightarrow{KMnO_4/OH^-} A \xrightarrow{SOCl_2} B \xrightarrow{NaN_3} C \xrightarrow{\text{Heat}} D$

A. An amide

B. primary amine

C. hydrocarbon

D. Phenyl isocyanate

Answer:

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6. Grignard reagents and organo lithium compounds on addition to dry ice separately , followed by hydrolysis gives

A. ketones and carboxylic acids

B. carboxylic acids and ketones

C. only carboxylic acids

D. only ketones

Answer:

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7. Acrylic acid on reduction with $Li[AlH_4]$ gives the product

A. $CH_3 - CH_2 - CHO$

B. $CH_2 = CH_2 - CHO$

C. $CH_2 = CH - CH_2OH$

D. $CH_3 - CH_2 - COOH$

Answer:

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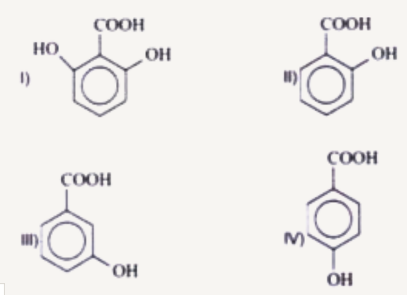
8. Which of the following is the correct order of acidity for the following compounds



A. $I > II > III > IV$

B. $III > I > II > IV$

C. $III > IV > II > I$

D. $I > III > IV > II$

Answer:

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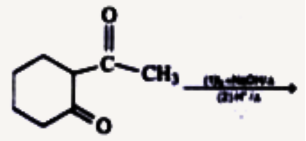
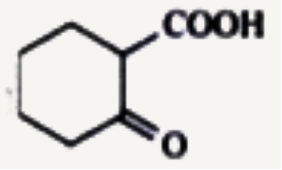
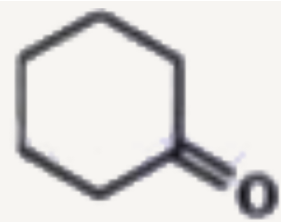
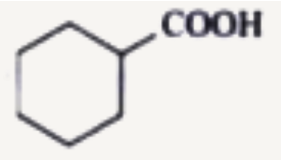
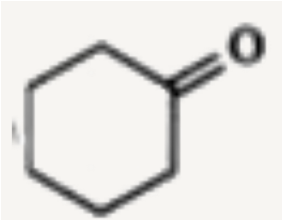
9. The end product of the following sequence of reactions is



A. yellow ppt of CHI_3 and 

B. yellow ppt of CHI_3 and 

C. yellow ppt of CHI_3 and 

D. 

Answer:

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10. Which of the following is the order of increasing basic stength for the following salts

(1) Sodium ethoxide (2) Potassium formate

(3) Sodium benzoate (4) Sodium dichloro acetate

A. $I < II < III < IV$

B. $IV < II < III < I$

C. $II < III < IV < I$

D. $IV < I < II < III$

Answer:

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11. What are the products 'A' and 'B' in the following sequence reactions :

1. $CH_3 - CH_2 - COOH \xrightarrow[Br_2]{\text{Red 'P'}} A$ 2. $A \xrightarrow[H^+]{\text{alc.KOH}} B$

A. $CH_3 - CHCOBr, CH_2 = CH - COOH$

B. $CH_3 - \overset{\overset{Br}{|}}{\underset{\underset{Br}{|}}{C}} - COOH, CH_2 = CHCOO$

C. $CH_3 - \underset{\underset{Br}{|}}{CH} - COOH, CH_2 = CHCOOH$

D. $\underset{\underset{Br}{|}}{CH_2} - CH_2COOH, CH_2 = CH - COOH$

Answer:

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12. In the reaction of carboxylic acid with CH_2N_2 to form an ester, the reaction intermediate is

A. Carbonium ion

B. Carbanion

C. Nitrene

D. Carbene

Answer:

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13. The reactivity of carboxylic acid derivative from highest to lowest reactivity is

A. Acid anhydride $>$ Acid chloride $>$ Acid ester $>$ Amide

B. Acid chloride $>$ Acid anhydride $>$ Ester $>$ Amide

C. Acid anhydride $>$ Ester $>$ Amide $>$ Acid chloride

D. Amide $>$ Ester $>$ Acid anhydride $>$ Acid chloride

Answer:

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14. Which of the following statements are correct about formic acid ?

A. It is stronger acid than banzoic acid

B. It reduces Tollen's reagent

C. It gives CO and H_2O whrn heated with con. H_2SO_4

D. All of these

Answer:

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15. In a set of reactions, acetic acid gives the following product 'D' $CH_3 - COOH \xrightarrow{SOCl_2} A \xrightarrow[\text{anhy. } AlCl_3]{C_5H_6} B \xrightarrow{HCN/OH^-} C \xrightarrow{H-OH/OH^-} D.$ The structure of product 'D' is

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16. In which of the following reactions, the number of carbon atoms does not decreases

A. Heating of a beta keto acid

B. Reaction of ethanamide with Br_2 and NaOH

C. Electrolysis of potassium salt of monocarboxylic acid

D. Heating of carboxylic acid with soda lime

Answer:

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17. Compound (A), C_8H_9Br, gives a white precipitate when warmed with alcoholic $AgNO_3$ Oxidation of (A) gives an acid (B),$C_6H_6O_4$. (B) easily forms anhydride on heating. Identify the compound (A)

A. 

B. 

C. 

D. 

Answer:

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18. Maleic acid and fumaric acid are two unsaturated dicarboxylic acids. Which of the following statements is incorrect.

A. The boiling point of fumaric acid is greater than maleic acid

B. Maleic acid on hydroxylation with dil. $KMnO_4/OH^-$ gives mesotartaric acid

C. Maleic acid is optically inactive

D. Maleic acid is less soluble in water than fumaric acid at constant temperature

Answer:

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19. The decreasing order of rate of ester formation of the following compounds with acetic acid in presence of H^+ ion is

1. $CH_3 - CH_2 - CH_2 - CH_2 - OH$

2. $CH_3 - CH_2 - \underset{\underset{OH}{|}}{CH} - CH_3$

3. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - OH$

4. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - OH$

A. $1 > 3 > 2 > 4$

B. $1 > 2 > 3 > 4$

C. $4 > 2 > 3 > 1$

D. $4 > 3 > 2 > 1$

Answer:

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20. The major product formed on monobromination of phenylbenzoate is

:

A. 

B. 

C. 

D. 

Answer:

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21. Which one of the following pairs gives effervescence with aqueous $NaHCO_3$

(I) $CH_3 - \overset{O}{\overset{||}{C}} - Cl$ (II) $CH_3 - \overset{O}{\overset{||}{C}} - CH_3$

(III) $CH_3 - \overset{O}{\overset{||}{C}} - O - CH_3$ (IV) $CH3COOCOCH3$: I and II I and IV II and III I and III

A. I and II

B. I and IV

C. II and III

D. I and III

Answer:

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22. Which one of the following gives carboxylic acid on reaction with HNO_2

A. C6H5COCl

B. $CH_3 - \overset{O}{\overset{||}{C}} - NH_2$

C. $CH_3 - COOCH_3$

D. $C_6H_5 - \overset{O}{\overset{||}{C}} - O - \overset{O}{\overset{||}{C}} - C_6H_5$

Answer:

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23. Salicylic acid when heated with fuming nitric acid. The product formed is

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24. A keto ester (A) with M.F. $C_6H_{10}O_3$ on treatment with NaOH and I_2 does not give iodoform but on boiling with dil. KOH gives a compound (B) with M.F. $C_4H_5O_3K$ which on acidification followed by heating undergoes decrboxylation to give acetone. The ketoester (A) is

A. $CH_3 - \overset{\overset{O}{||}}{C} - CH_2 - CH_2 - COOC_2H_3$

B. $CH_3 - \overset{\overset{C}{||}}{C} - CH_2 - COOC_2H_5$

C. $CH_3 - CH_2 - O - CH_2 - COOCH_3$

D. $CH_3 - \overset{\overset{O}{||}}{C} - \underset{\underset{CH_3}{|}}{CH} - COOCH_3$

Answer:

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25. correct sequence of acid strength is ?

$CH_3 - CH_2 - COOH, CH = C - COOH, CH_2 = CH - COOH$

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26. Carboxylic acids, esters and amides do not give the properties of ketones. It is due to

A. Inductive effect

B. Electromeric effect

C. Resonance

D. All of these

Answer:

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27. Which of the following compounds will give Hofmann bromamide reaction

A. 

B. 

C. 

D. 

Answer:

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Level Ii Assertion Reason

1. Assertion : p-chlorobenzoic acid is more acidic than p-fluorobenzoic acid.

Reason : +R effect of fluorine is higher than that of chlorine due to the matching size of carbon and fluorine.

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Both assertion and reason are false

Answer:

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2. Assertion : Saicylic acid is stronger than m and p-hydroxy benzoic acid.

Reason : Carboxylate ion is stabilized by intramolecular H-bonding.

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Both assertion and reason are false

Answer:

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3. Assertion : p-Amino benzoic acid exitss as Zwitter ion whereas p-aminobenzene sulphonic acid does not.

Reason : $-SO_3H$ group is less acidic than carboxyl group.

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Both assertion and reason are false

Answer:

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4. Assertion : Carboxylic acids contain a carbonyl group but do not give characteristic reaction of the carbonyl group.

Reason : The electrophilicity of the carbonyl carbon is more in carbocylic acids than in aldehydes and ketones.

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Both assertion and reason are false

Answer:

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