CHEMISTRY

BOOKS - R SHARMA CHEMISTRY (HINGLISH)

ALKENES

Example

1. Work out all possible structural isomeric alkenes corresponding to C_5H_{10} and also give their $IUPAC$ names.

Strategy: Alkene isomers are deduced by writing the different C skeletons and then introducing the double bond at different locations. The possible skeletons are

$$C-C-\underset{(I)}{C}-C-C, C-\underset{\underset{(II)}{C}}{\overset{|}{C}}-C-C, C-\underset{\underset{(III)}{C}}{\overset{\overset{C}{|}}{\overset{|}{C}}}-C$$

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2. While of the following compounds will exhibit geometrical (or cis-trans) isomerism?

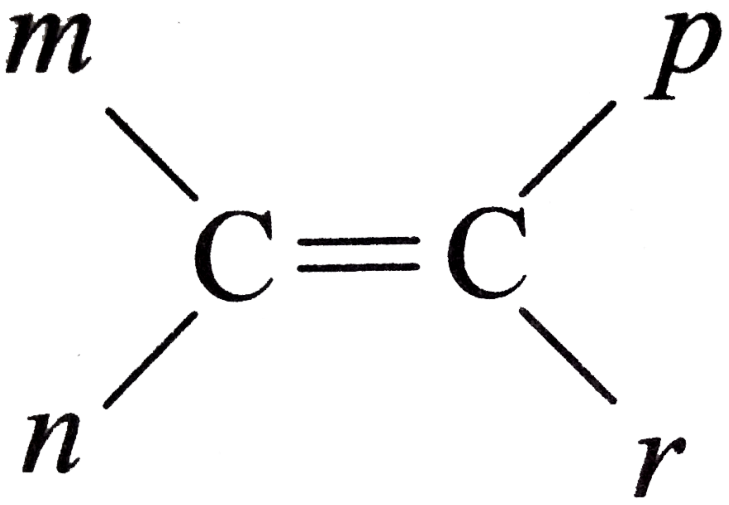
(i) $CH_3CH = CHCH_2CH_3$

(ii) $C_6H_5CH = CHCH_3$

(iii) $CH_2 = C(CH_3)_2$

$(CH_3)_2C = CH - C_2H_5$

Strategy: Essential requirement for any alkene to exhibit geometrical isomerism is that each of the double bonded carbon atoms should be attached to two different atoms or groups of atoms:



$m \neq n$ and $p \neq r$. Notice that m and p may be same or different Similarly, n and r may be same or different.

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3. Draw geometrical (or cis-and trans-) isomers of the following structures and give their $IUPAC$ names.

(i) $C_2H_5CCH_3 = CCH_3C_2H_5$

(ii) $CH_3CH_2CH = CHCH_2CH_3$

Strategy: An isomer in which two identical atoms (or groups) lie on the same sides of the double bond is called as cis isomer whereas an isomers in which identical atoms (or groups) lie on the opposite sides of the double bond is called a trans isomer.

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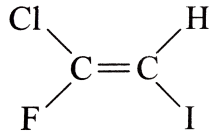
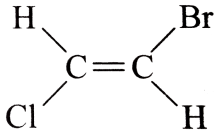
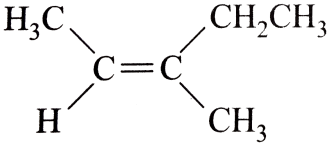
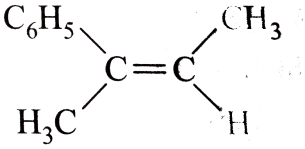
4. Classify the following alkenes and their derivatives as Z or E

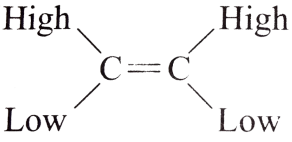
(i) 

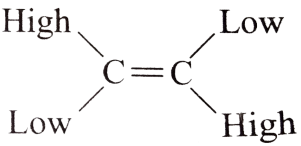
(ii) 

(iii) 

(iv) 

(i)



E: 

(ii)

Strategy: This method is preferable to the use of cis-trans beacuse it is not practical to identify cis and trans isomers when the four groups on $C = C$ are different. The letter Z is used when the two high-priority substituets are on the same side of the double bond and the letter E is used when they are on the opposite sides (from the German words zusammen meaning together and entgegen meaning opposite), as shown:

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5. Using Markovnikov's rule, correctly predict the principal product of the following reactions:

(i) $\text{But-1-ene} + HI \rightarrow$

(ii) $\text{Vinyl chloride} + HI \rightarrow$

(iii) $But - 2 - \text{ene} + HI \rightarrow$

(iv) $2 - \text{Methylbut-2-ene} + HI \rightarrow$

(v) $\text{Pent-2-ene} + HI \rightarrow$

Strategy: Use Markovnikov's rule for unsymmetrical alkenes: Positive part of the addendum (adding molecule, HI) gets attached to that doubly bonded carbon atom which possesses more number of hydrogen atoms:

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6. Find the products obtained by the addition of HBr "to $\text{hex} - 1 - e \neq$ "

(i) in the presence of preoxide

(ii) in the absence of peroxide

Also write their $IUPAC$ names.

(i) Strategy: In the presence of peroxides, the particle that attacks the double bond first is the large bromine atom. It attaches itself to the less

hindered carbon atom to form a more stable free radical. The result is anti-Markovnikov's addition.

(ii) Strategy: In the absence of peroxides, the particle that attacks the double bond first is a proton (beacuse a proton is small, steric effect are not important). It attaches itself to a carbon atom by an ionic mechanism to form the most stable carbocation. The result is Markovnikov's addition.

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7. In one industrial synthesis of ethanol, ethane is first dissolved in $95\,\%$ sulphuric acid. In the second step, water is added and the mixture is heated. Outline the reaction involved.

Strategy: Alkyl hydrogen sulphates are easily hydrolyzed to alcohols by heating with water.

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8. An unknown alkene of molecular formula C_8H_{16} on oxidation with hot alkakline $KMnO_4$ yields propanoic acid and pentanoic acid. Find the

structure of the alkene.

Strategy:

$C_8H_{16} \underset{(2)\, H_3O^+}{\overset{(1)\, KMnO_4}{}}$,H_(2)O,OH^(-)"heat")rarrCH_(3)CH_(2)-underset("acid")underset("Pentanoic")overset(O)overset(||)C-OH+HO-underset("acid")underset("Pentanoic")overset(O)overset(||)C-CH_(2)CH_(2)CH_(2)CH_(3)$Removethe$OH` groups and join the carboxylic acid carbons by a double bond to get the alkene.

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9. An known alkene with formula C_7H_{12} on oxidation with hot alkaline $KMnO_4$ yields only the following product

$$CH_3 - \overset{O}{\overset{||}{C}} - CH_2CH_2CH_2CH_2 - \overset{O}{\overset{||}{C}} - OH$$

What is the structure of this alkene?

Strategy:

$$C_7H_{12} \xrightarrow[(2)\, H_3O^+]{(1)\, KMnO_4, H_2O, \bar{O}H} CH_3\overset{O}{\overset{||}{C}}CH_2CH_2CH_2CH_2\overset{O}{\overset{||}{C}} - OH$$

Since the oxidation cleavage leads to just one product which contains the same number of carbon atoms as the reactant, the unknown alkene must

have a double bond contained in a ring. The oxidative cleavage of the double bond result in the opening of the ring. To create the ring, remove the -OH group and doubly bonded $O's$ and finally join the carboxylic acid carbon with ketone carbon by a double bond.

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Follow Up Test 1

1. Alkenes are unsaturated acyclic hydrocarbons whose molecules contain ..... Carbon-carbon double bonds (s).

A. just one

B. more than one

C. one or more

D. two or more

Answer: A

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2. Which of the follwing alkenes was called olefiant gas?

A. CH_2

B. C_2H_4

C. C_3H_6

D. C_4H_8

Answer: B

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3. The $C - C$ distance in ethane is

A. 154pm

B. 139pm

C. 134pm

D. 120pm

Answer: C

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4. The $H-C=C($ or $C=C-H)$ bond angle in ethane is

A. 120°

B. 118°

C. 180°

D. 121°

Answer: D

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5. The maximum number of atoms that might exist in one plane in but-2-ene is

A. 6

B. 8

C. 4

D. 10

Answer: B

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6. Which of the following statements is incorrect ?

A. The $C - H$ bond length in both ethene and ethane is identical.

B. The $C - H$ bond in ethane is longer than in ethene.

C. The $C - H$ bond in ethene is shorter than in ethane.

D. Both (2) and (3)

Answer: C

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7. In

$$C \overset{a}{-} C = C \overset{b}{-} C = C \overset{c}{-} C \overset{d}{-} C$$

the strongest $C - C$ single bond is

A. b

B. a

C. c

D. d

Answer: A

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8. What is the degree (or element) of unsaturation for C_4H_8?

A. Zero

B. One

C. Two

D. Three

Answer: B

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9. The possible number of isomers having the formula C_3H_6 is

A. 5

B. 4

C. 2

D. 3

Answer: C

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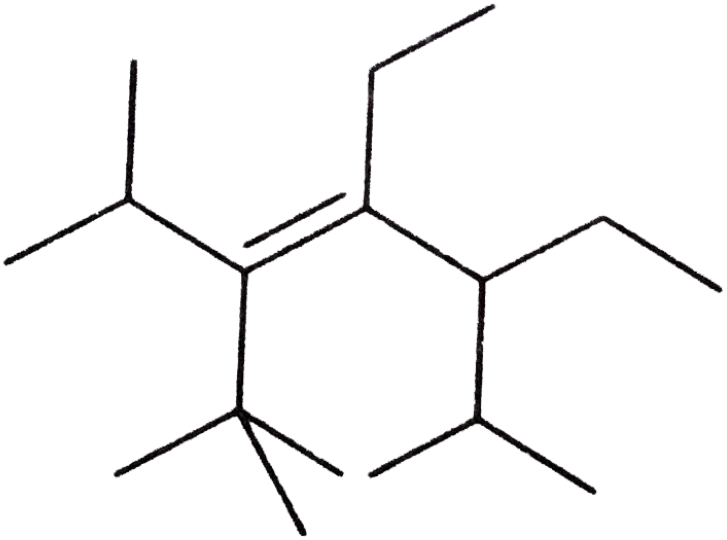
10. The $IUPAC$ name of the following alkene



is

A. $4-$ ethyl-2,2-dimethyl-3.5-bis$(1-$ methylethyl$)hept-3-$ ene

B.

$3-(1,1-$ dimethylethyl$)-4,5-$ diethyl-2,6-dimethylhept-3-ene

C. $4,5-$ diethyl-2,2,6-trimethyl-3-(1-methylethyl)hept-3-ene

D. $3-$ t-butyl-4-ethyl-5-isopropyl-2-methylhept-3-ene

Answer: C

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11. The $IUPAC$ name of the allyl group is

A. vinylmethyl

B. prop-1-enyl

C. 1-methylethenyl

D. prop-2-enyl

Answer: D

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12. Which of the follwing exhibits geometric isomerism?

A. $3-\text{Methylpent-2-ene}$

B. Cyclohexene

C. $2-$ Methylpent-2-ene

D. $2,3-$ Dimethylpent-2-ene

Answer: A

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13. How many alkenyl group can be derived from propane?

A. 4

B. 3

C. 2

D. 1

Answer: B

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14. The interconversion of cis-and trnas-isomers of an alkene is possible by

A. treatment with a strong acid

B. UV light

C. heat

D. all of these

Answer: D

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Follow Up Test 2

1. When isopropyl iodide is treated with a hot concentrated alcoholic solution of a strong base like potassium hydroxide, is obtained.

A. Propylene

B. potassium bromide

C. water

D. all of these

Answer: D

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2. Dehydrohalogenation of an alkyl halide is called elimination.

A. alpha (α)

B. beta (β)

C. gamma (γ)

D. omega (ω)

Answer: B

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3. Various strong bases have been used for dehydrohalogenation. Ptassium hydroxide dissolved in ethanol is a reagent sometimes used, but the sodium salts of alcohols, such as (and potassium) alkoxides are usually prepared by treating an excess of the alcohol with

A. $NaOH$

B. NaH

C. Na

D. Both (2) and (3)

Answer: D

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4. In dehydrohalgenation by ethanolic KOH, the active base is

A. ethanol

B. KOH

C. ethoxide ion

D. hydroxide ion

Answer: C

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Follow Up 3

1. Neopentyl bromide is heated with an alcoholic KOH solution. The major alkene formed is

A. pent-2-ene

B. 2-methylbut-1-ene

C. 2-methylbut-2-ene

D. no reaction as the halides does not contain β-hydrogen.

Answer: C

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2. Which of the alkyl halides is least suitable for dehydrohalogenation ?

A. RF

B. RCI

C. RBr

D. RI

Answer: A

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3. 2-Iodobutane on treatment with $C_2H_5Ona\,/\,C_2H_5OH$ yields but -2-ene as the major product. This regioselecetion is in accordance with the

A. Hoffmann rule

B. Saytzeff rule

C. Markovniko rule

D. Kharasch rule

Answer: B

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4. How many alkenes are formed from the reaction of 2-bro-mobutane and alc. KOH ?

A. Two

B. Four

C. Three

D. Just one

Answer: C

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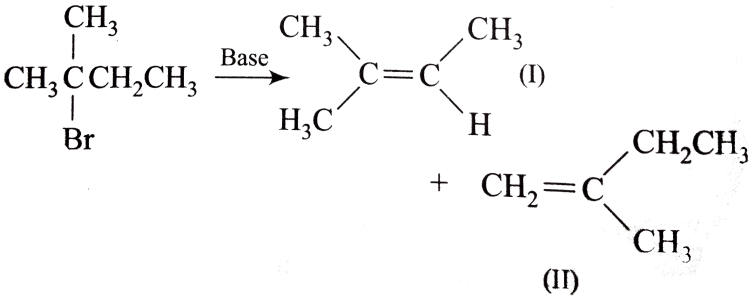
5. Consider the follwing reaction



Which of the following bases will give the best yield of alkene (II) as the major product ?

A. $(CH_3)_3CO^-$

B. $C_2H_5O^-$

C. CH_3O^-

D. $(C_2H_5)_3CO^-$

Answer: D

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6. Which of the follwing bases will give the best yield a mixture of alkenes on dehydrohalgenation ?

A. n-Butyl bromide

B. sec-Butyl bromide

C. Isobutyl bromide

D. tert-Butyl bromide

Answer: B

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7. What is the experimentally-determined rate expression for the base-induced β-elimination?

A. $\text{Rate} = [RX]\left[B^-\right]^2$

B. $\text{Rate} = [RX]^2\left[B^-\right]$

C. $\text{Rate} = K[RX]\left[B^-\right]$

D. $\text{Rate} = K[RX]$

Answer: C

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8. Which of the follwing undergoes fastest dehydrohalogention ?

A. CT_3CH_2I

B. CD_3CH_2I

C. CH_3CH_2I

D. All are equally reactive

Answer: C

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9. Dehydrohalogenation of an alkyl halide by an $E2$ elimination is

A. a syn elimination

B. an anti elimination

C. either syn or anti elimination depending upon substrate

D. neither syn or nor anti elimination

Answer: B

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Follow Up 4

1. The dehydration of alcohols to form alkenes is catalyzed by

A. an acid

B. a base

C. either an acid or a base

D. neither an acid nor a base

Answer: A

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2. Dehydration of alcohols to form alkenes is favored at

A. lower temperature

B. higher temperature

C. moderate temperature

D. room temperature

Answer: B

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3. Which of the following is often used in industrial, gas-phase dehydration of alcohols ?

A. H_2SO_4

B. H_3PO_4

C. Al_2O_3

D. All of these

Answer: C

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4. Which of the following alkenes is formed when butan-1-ol is heated with concentrated H_2SO_4 ?

A. But-1-ene

B. cis-But-2-ene

C. trans-But-2-ene

D. All of these

Answer: D

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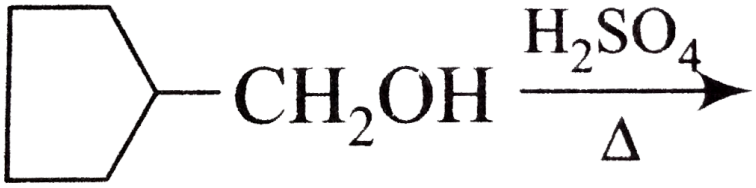
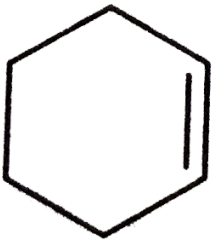
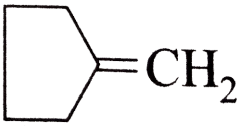
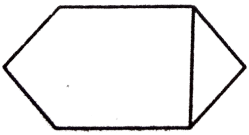
5. For the reaction

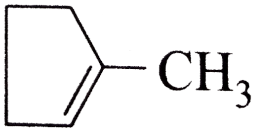


the major product is

A. 

B. 

C. 

D. 

Answer: D

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6. Ethyl alcohol is heated with concentrated $H_2SO_4 at 170^\circ C$. The product formed is

A. ethyl hydrogen sulphate

B. diethyl sulphate

C. ethylene

D. diethyl ether

Answer: C

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7. Which of the following alcohols is most easily dethydrated ?

A. Butan-1-ol

B. 2-Methylpropane-2-ol

C. Butan -2-ol

D. 2-Methylpropan-1-ol

Answer: B

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8. Dehydration of ..... Alcohols is carried out with concentrated sulphuric acid.

A. Primary

B. secondary

C. tertiary

D. all of these

Answer: A

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Follow Up 5

1. The reaction

$$BrCH_2CH_2Br + Zn \xrightarrow{CH_3CO_2H} CH_2 = CH_2 + ZnBr_2$$

proceeds by the ..... mechanism.

A. $E1 - cB$

B. $E2$,syn-elimination

C. $E2$,anti elimination

D. $E1$

Answer: C

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2. 1, 3-Diiodopropane is heated with zinc dust in ether. The product formed is

A. 3-bromopropane

B. propane

C. propene

D. cyclopropane

Answer: D

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3. Consider the thermal decomposition

$$CH +_3 \underset{CH_3}{CH_2CH} - \overset{+}{N}(CH_3)_3OH^- \xrightarrow{\Delta}$$

Which of the following is the major product ?

A. But-1-ene

B. cis-But-2-ene

C. trans-But-2-ene

D. A mixture of (2) and (3)

Answer: A

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4. In the reaction

$$(CH_3)_2CH - \underset{CH_3}{\underset{|}{CH}} - \overset{+}{S}(CH_3)_2Br \xrightarrow{Heat}$$

Which of the following alkenes is formed in the largest amount ?

A. $(CH_3)_2C = CHCH_3$

B. $CH_2 = \overset{CH_3}{\underset{|}{C}} - CH_2CH_3$

C. $(CH_3)_2CHCH = CH_2$

D. No alkene formation

Answer: C

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5. Which of the following reagents is required in the synthesis of alkenes by Witting reaction?

A. H_2NNH_2

B. B_2H_6

C. $(C_6H_5)_3P$

D. $(C_2H_5O)_3P$

Answer: C

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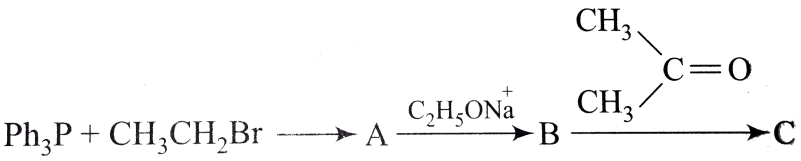
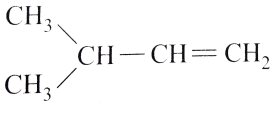
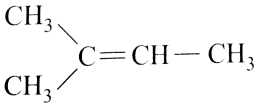
6. Consider the following sequence of reactions:



The final product is C is

A. 

B. 

C. $Ph_3P = CHCH_3$

D. $Ph_3\overset{+}{P}CH_2CH_3Br$

Answer: B

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7. Which of the following is known as original Lindlar's catalyst?

A. $Pd - CaCO_3 + Pb(OAC)_2$

B. $Pd - BaSO_4 + \text{Quinoline}$

C. $Pd - C + \text{Quinoline}$

D. $(C_2H_5)_3Al + TiCl_4$

Answer: A

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8. But-2-ene reacts with H_2 in the presence of Lindlar's catalyst. The predominant product of reaction is

A. butane

B. buta-1, 3-diene

C. cis-but-2-ene

D. trans-but-2-ene

Answer: C

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9. The electrolysis of an aqueous solution of sodium."____ "produces ethene.

A. oxalate

B. succinate

C. malonate

D. adipate

Answer: B

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Follow Up 6

1. Unbranched alkenes containing 5 to ..... C atoms are liquids at room temperature.

A. 18

B. 17

C. 16

D. 15

Answer: B

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2. Which of the following is incorrect for cis-but-2-ene relative to trans-but-2-ene?

A. It has higher dipole moment.

B. It has higher boiling point.

C. It has higher melting point.

D. All of these

Answer: C

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3. Which of the following has zero dipole moment?

A. $Cl_2C = CCl_2$

B. trans-But-2-ene

C. $CH_2 = CH_2$

D. All of these

Answer: D

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4. Alkenes are only very slightly soluble in

A. chloroform

B. ether

C. water

D. benzene

Answer: C

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Follow Up 7

1. Alkenes are readily hydrogenated under pressure in the presence of a catalyst. Which of the following catalysts is effective at room temperature ?

A. Platinum black

B. Palladium black

C. Raney nickel

D. Alll of these

Answer: D

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2. Adam's platinum used for the catalytic hydorgenation of alkenes is

A. platinum oxide

B. platinum hydride

C. platinum nitride

D. platinum halide

Answer: A

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3. Which of the following has highest heat of hydrogenation:

A. Methylpropene

B. But-1-ene

C. cis-But-2-ene

D. trans-but-2-ene

Answer: B

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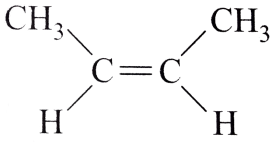
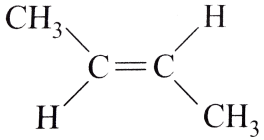
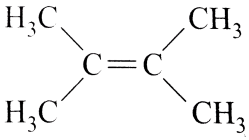
4. Which of the following alkenes is most stable?

A. $CH_3CH = CH_2$

B. 

C. 

D. 

Answer: D

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5. Catalystic hydrogenation is most easy in alkenes of the type

A. $R_2C = CH_2$

B. $RCH = CHR$

C. $R_2C = CHR$

D. $R_2C = CR_2$

Answer: B

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6. Propene on reaction with diimide, $HN = NH$, gives

A. $(CH_3CH_2CH_2)_2NH, NH_3$

B. $\underset{|}{\overset{NH_2}{CH_3CH}} - \underset{|}{\overset{NH_2}{CH_2}}$

C. $C_3CH_2CH_3, N_2$

D. $CH_3 - \underset{|}{\overset{NH_2}{CH}}CH_3 - NH_3$

Answer: C

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7. Cyclohexane and two equivalents of hex-1-ene are heated in the presence of Pd but in the absence of H_2. The products of the reaction are

A. hexane and cyclohexane

B. hexane and cyclohexa-1, 3-diene

C. hexane and cyclohexa-1, 4-diene

D. hexane and benzene

Answer: D

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8. A characteristic reaction of compounds with a carbon-carbon double bond is an addition reaction. Addition reactions are

A. usually endothermic

B. usually exothermic

C. endothermic or exothermic depending upon the reagent added

D. neither endothermic nor exothermic

Answer: B

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9. Alkenes mainly undergo

A. electrophilic addition reactions

B. nucleophile addition reactions

C. free-radical addition reactions

D. both and (1) and (3)

Answer: A

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Follow Up 8

1. Alkenes react rapidly with chlorine or bromine in non-nucleophilic solvents to form

A. geminal dihalides

B. α, ω-dihalides

C. vicinal dihalides

D. a mixture of (1) and (3)

Answer: C

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2. Which of the following halogens is employed for the test of unsaturation?

A. Iodine

B. Bromine

C. Chlorine

D. Fluorine

Answer: B

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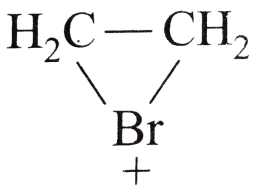
3. Ethylene reacts with Br_2 to give $1,2$-dibromoethane. The reaction proceeds through the formation of the intermediate

A. $BrCH_2\overset{+}{C}H_2$

B. $BrCH=\overset{+}{C}H$

C. 

D. 

Answer: C

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4. Ethylene reacts with Br_2 in methanol to yeild

A. 1, 2-dibromoethane

B. 1-bromo-2-methoxyethane

C. a mixture of (1) and (2)

D. 1, 2-dimethoxy ethane

Answer: C

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Follow Up 9

1. Which of the following hydrogen halides is the most difficult to add to the double bond of alkenes ?

A. HI

B. HBr

C. HCl

D. HF

Answer: D

Watch Video Solution

2. Which of the compounds is the least reactive toward the addition of hydrogen halides?

A. $(CH_3)_2C = CH_2$

B. $CH_3CH = CHCH_3$

C. $CH_2 = CH - Cl$

D. $CH_2 = CH_2$

Answer: C

Watch Video Solution

3. In the reaction

$(CH_3)_2C - CH = CH_2 + HBr \rightarrow$

the chief product is

A. $(CH_3)_2\underset{\underset{Br}{|}}{C} - CH(CH_3)_2$

B. $(CH_3)_3C - \underset{\underset{Br}{|}}{CH} - CH_3$

C. $(CH_3)_3CH_2CH_2Br$

D. $(CH_3)_2CH\ \underset{\underset{CH_3}{|}}{C}\ HBr$

Answer: A

Watch Video Solution

4. The addition of HBr to but-1-ene in the presence of dibenzoyl peroxide yields

A. $(\pm) - 2 -$ bromobutane

B. $1-$ bromobutane

C. $(\pm)1-$ bromobutane

D. $2-$ bromobutane

Answer: B

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5. The anti-Markovnikov's addition of HBr to alkenes in the presence of peroxides was rationalized by

A. M.S. kharasch

B. F.R. Mayo

C. Vladimir Markovnikov

D. Both (1) and (2)

Answer: D

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6. the addition of HBr to an alkene in the presence of a peroxide is

A. a nucleophilic addition via an alkyl anoin intermediate

B. an electrophilic addition via an alkyl cation intermediate

C. a free-radical addition via a β-bromo alkyl radical intermediate

D. a free-radical addition via an α-bromo alkyl radical intermediate

Answer: C

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7. The intermediate formed during the addition of HCl to propene in the presence of a peroxide is

A. $CH_3\overset{+}{C}HCH_3$

B. $ClCH_2\dot{C}HCH_3$

C. $CH_3\underset{Cl}{\underset{|}{C}}HCH_2$

D. $CH_3CH_2CH_2$

Answer: A

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8. In the presence of a peroxide, hydrogen chloride and hydrogen iodode do not undergo anti-Markovnikov's addition to alkenes because

A. both are highly ionic

B. one is oxidizing and the other is reducing

C. one of the steps is endothermic in both the cases

D. all the steps is endothermic in both the cases

Answer: C

View Text Solution

9. which of the following alkenes should be used to synthesize 3-bromohexane by reaction with HBr?

A. Hex-1-ene

B. Hex-2-ene

C. Hex-3-ene

D. Both (2) and (3)

Answer: C

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Follow Up 10

1. Markovnikov's rule is empirical but may be explained theoretically on the basis that the addition occurs by a

A. carbanion intermediate

B. carbocation intermediate

C. carbene intermediate

D. carbon free radical intermediate

Answer: B

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2. Alkanes are absorbed by concentrated sulphuric acid to from

A. alkyl sulphates

B. alkyl hydrogen sulphate

C. alcohols

D. ethers

Answer: B

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3. Alkyl hydrogen sulphates can be easily hydrolyzed to alcohols by heating them with water. Which of the following alcohols can be made by this method?

(i) Isopropyl alcohol

(ii) n-Propyl alcohol

(iii) Isobutyl alcohol

(iv) tert-Butyl alcohol

A. (i),(iii)

B. (ii),(iii)

C. (i),(iv)

D. (ii),(iv)

Answer: C

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4. Which of the following is not the characterstic of acid catalyzed hydration of alkenes?

A. Reaction requires an acidic reagent.

B. The rate of reaction depends upon the concentration of both the alkene and the acidic reagent.

C. Where the reaction permits, it is accompanied by rearrangements.

D. The reaction is irreversible.

Answer: D

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5. The addition of the compound containing a hydrogen-boron bond $H-B<$ (called a boron hydride) useful synthetic procedures. This addition, called hydrocarbon, is carried out by using the boron hydride.

A. BH_3

B. $(BH_3)_2$

C. $(BH_3)_3$

D. $(BH_3)_4$

Answer: B

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6. Propene is allowed to react with diobrane and the product is treated with alkaline H_2O_2. The final product is

A. propanal

B. propanone

C. propan$-1-ol$

D. propen$-2-ol$

Answer: C

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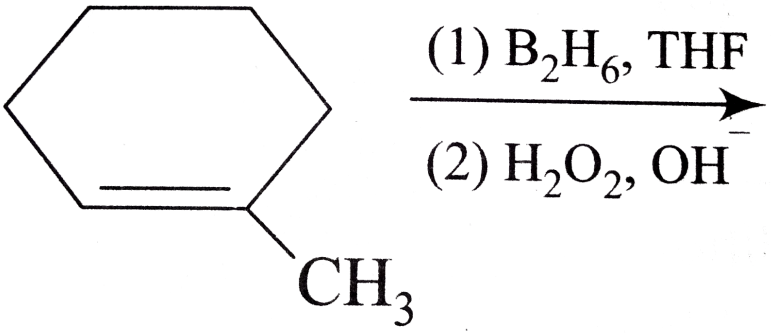
7. Consider the reaction.



The product formed is

A. $(\pm)cis-2-$ Methylcyclohexanol

B. $(\pm)-trans-$ 2-Methylcyclohexanol

C. 2-Methylcyclohexanol

D. 1-Methylcyclohexanol

Answer: B

Watch Video Solution

8. In the reaction

$$CH_3CH = CH_2 \xrightarrow[(2)\,NaBH_4]{(1)\,(CH_3COO)_2Hg,\,H_2O}$$

The product is obtained is

A. propanone

B. propanal

C. prop-2-ol

D. propan-1-ol

Answer: C

Watch Video Solution

9. In the reaction

$$CH_3CH_2CH = CH_2 \xrightarrow[(2)\,NaBD_4]{(1)\,Hg(OAc)_2,\,H_2O}$$

the product obtained is

A. $CH_3CH_2CD_2CH_2OH$

B. $CH_3CH_2CD(OH)CH_3$

C. $CH_3CH_2CHCCH_2OH$

D. $CH_3CH_2CH(OH)CH_2D$

Answer: D

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10. Which of the following is formed when three moles of propene react with one mole of BH_3 in tetrahydrofuran (THF), a cyclic ether?

A. Pr_3B

B. $PrBH_2$

C. Pr_2BH

D. All of these

Answer: A

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11. The electrophile in hydrocarbon is

A. BH_3

B. $(BH_3)_2$

C. $(BH_3)_3$

D. H^+

Answer: A

Watch Video Solution

12. $CH_3CH = CH_2 \xrightarrow[THF]{B_3H_6} A \xrightarrow{Br_2} B$

The product B of the reaction is

A. $CH_3\underset{\underset{Br}{|}}{C}HCH_3$

B. $CH_3\underset{\underset{Br}{|}}{C}HCH_2Br$

C. $CH_3CH_2CH_2Br$

D. $CH_3CH_2CHBr_2$

Answer: C

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Follow Up 11

1. Ethene on reaction with Br_2 in H_2O forms mainly

A. 2-bromoethanol

B. 1, 2-boromoethane

C. ethane-1, 2-diol

D. an equimolar mixture of (1) and (3)

Answer: A

Watch Video Solution

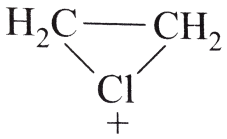
2. The intermediate formed in the reaction

$$CH_2 = CH_2 + HOCl \xrightarrow{H^+}$$

A. $ClCH_2\overset{+}{C}H_2$

B. $HOCH_2\overset{+}{C}H_2$

C. $ClOCH_2\overset{+}{C}H_2$

D. 

Answer: D

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3. The product formed in the reaction

$$CH_3 - \underset{CH_3}{\overset{|}{C}} = CH_2 + CH_3 - \overset{CH_3}{\overset{|}{C}}H - CH_3 \xrightarrow[0-10^\circ c]{HF}$$

is

A. $CH_3C(CH_3)_2-CH_2-C(CH_3)=CH_2$

B. $CH_3C(CH_3)_2-CH=C(CH_3)-CH_3$

C. $CH_3C(CH_3)_2-CH_2-C(CH_3)H-CH_3$

D. $CH_3CH(CH_3)CH_2CH_2CH(CH_3)CH_3$

Answer: C

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4. The minor product obtained in the acid-catalyzed dimerization of methylpropene is

A. $(CH_3)_3CCH_2C(CH_3)=CH_2$

B. $(CH_3)_3C-CH_2CH(CH_3)_2$

C. $(CH_3)_2CHCH=CHCH(CH_3)_2$

D. $(CH_3)_2CCH = C(CH_3)_2$

Answer: D

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5. $(CH_3)_2C = CH_2 \xrightarrow[H_2O]{Br_2}$

The major product of the reaction is

A. $(CH_3)_2C(OH)CH_2Br$

B. $(CH_3)_2C(Br)CH_2OH$

C. $(CH_3)_2C(OH)CH_2OH$

D. $(CH_3)_2C(Br)CH_2Br$

Answer: A

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6. $CH_3CH = CH_2 + BrCCl_3 \xrightarrow{\text{Peroxide}}$

The major product of the reaction is

A. $CH_3CHClCH_2CBrCl_2$

B. $CH_3CHBrCH_2CCl_3$

C. $ClCH_2CHBrCG_2CHCl_2$

D. $BrCH_2CHClCH_2CHCl_2$

Answer: B

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7. $CH_3CH = CH_2 + NOCl \rightarrow P$

Identify the product.

A. $CH_3\underset{Cl}{\underset{|}{C}}H\,\underset{NO}{\underset{|}{C}}\,H_2$

B. $CH_3\,\underset{NO}{\underset{|}{C}}\,H\underset{Cl}{\underset{|}{C}}H_2$

C. $CH_3CH_2\underset{\underset{Cl}{|}}{C}HNO_2$

D. $\underset{\underset{NO}{|}}{C}H_2 - CH_2 - \underset{\underset{Cl}{|}}{C}H_2$

Answer: A

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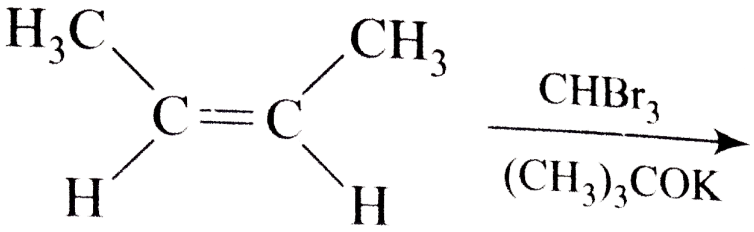
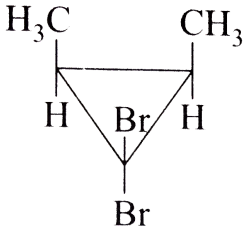
8. Consider the following reaction

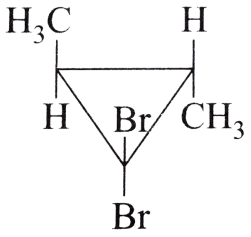


The product formed in the reaction is

A.



B. $CH_3CH(Br)\underset{\underset{CH_3}{|}}{C}HCHBr_2$

C. 

D. an equimolar mixture of (1) and (3)

Answer: A

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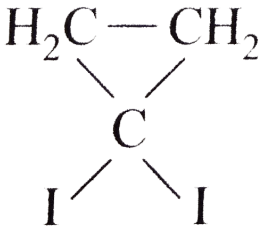
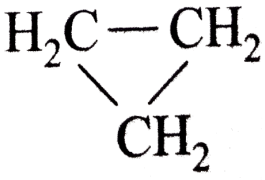
9. Ethylene reacts with CH_2CI_2 in the presence of $Zn - Cu$ couple to form

A. 

B. 

C. $CH_3\underset{\underset{I}{|}}{C}Ch\underset{\underset{I}{|}}{C}H_2$

D. $ICH_2CH_2CH_2I$

Answer: B

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Follow Up 12

1. Which of the following reagents can distinguish between propene and propane ?

(i) Br_2/CCl_4

(ii) Conc. H_2SO_4

(iii) Dilute $KMnO_4$ solution

(iv) H_2/Pt

A. (i),(iii)

B. (i),(ii),(iii)

C. (i),(ii),(iii),(iv)

D. (ii),(iii)

Answer: C

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2. Ethene reacts with cold dilute $KMnO_4$ to produce

A. ethane-1, 2-dial

B. ethanol

C. ethanal

D. ethane -1, 2-diol

Answer: B

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3. The olefin which on ozonolysis gives CH_3CH_2CHO and CH_3CHO is

A. but-2-ene

B. pent$-1-$ ene

C. pent-2-ene

D. but-1-ene

Answer: C

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4. But-2- ene $\xrightarrow[CCl_4]{N-\text{Bromosuccinimide}}$

The product formed in the reaction is

A. $CH_3CH=C(Br)CH_3$

B. $CH_3CH=CHCH_2Br$

C. $CH_3CH(Br)CH(Br)CH_3$

D. $CH_3C(Br)=C(Br)CH_3$

Answer: B

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5. An alkene on ozonolysis gives isobutyric acid only. The alkene is

A. 2, 5-dimethylhex-3-ene

B. 3, 4-dimethylhex-3-ene

C. 2, 3-dimethylbut-2-ene

D. 3-methylpent-1-ene

Answer: A

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6. $CH_3CH = CH_2 \xrightarrow[CH_2Cl_2]{m-\text{Chloroperoxbenzoic acid}}$

The product of the reaction is

A. propanone

B. propan-2-ol

C. oxirane

D. 2-methyloxirane

Answer: D

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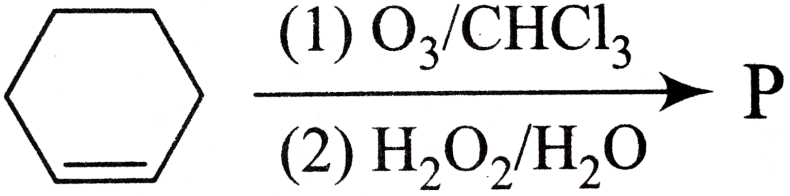
7. 

Identify the product P.

A. Malonic acid

B. Succinic acid

C. Adipic acid

D. Oxalic acid

Answer: C

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8. A hydrocarbon C_8H_{16} on oxidation with a hot adidified solution of $KMnO_4$ forms butanone and isobutyric acid. The hydrocarbon is

A. $CH_3CH_2\underset{\underset{CH_3}{|}}{C}=\underset{\underset{CH_3}{|}}{C}CH_2CH_3$

B. $(CH_3)_2C=\underset{\underset{CH_3}{|}}{C}CH_2CH_2CH_3$

C. $(CH_3)_2C=C(CH_2CH_3)_2$

D. $(CH_3)_2CHCH=\underset{\underset{CH_3}{|}}{C}CH_2CH_3$

Answer: D

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Question Bank

1. The skeleton made up of the σ-bonded atoms in ethene is planar because the $C's$ use

A. $sp^2HO's$

B. $sp^3HO's$

C. $spHO's$

D. $dsp^2HO's$

Answer: A

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2. Vapor of ethyl alcohol is passed over heated alumina at $375^\circ C$. The product is

A. diethy ether

B. ethylene oxide

C. acetaldehyde

D. ethylene

Answer: D

Watch Video Solution

3. Which of the following hydrogen halides in the presence of peroxides undergoes addition reaction with propene in an anti-Markovnikov fashion?

A. HBr

B. HF

C. HCl

D. Hl

Answer: A

Watch Video Solution

4. Which of the following is known as `Baeyer's reagent used for the test of unsaturation?

A. $CuCl / NH_4OH$

B. $AgNO_3 / NH_4OH$

C. Br_2 / CCl_4

D. Dilute,slightly alkaline $KMnO_4$

Answer: D

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5. The total number of alkenes (constitutional and configurational) possible for the formula C_4H_8 is

A. 4

B. 3

C. 2

D. 5

Answer: A

Watch Video Solution

6. Dehydrohalogenation of alkyl halides to form alkenes is promoted (or catalyzed) by

A. a base

B. an acid

C. both and acid as well as a base

D. neither an acid nor a base

Answer: A

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7. 1-Bromobutane is treated with sodium ethoxide in ethanol. The major product obrained is

A. trans-but-2-ene

B. cis-But-2-ene

C. but-1-ene

D. 1-ethoxybutane

Answer: C

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8. Which of the following alkyl halides will not undergo dehydrohalogenation unless the conditions are drastic ?

A. 2-Chloro-2, 3-dimethylbutane

B. 1-Chloro-2, 2-dimethylpropane

C. 3-Chloro-2, 2-dimethylbutane

D. 1-Chloro-2, 3-dimethylbutnae

Answer: B

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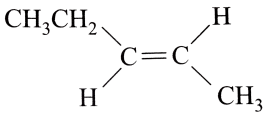
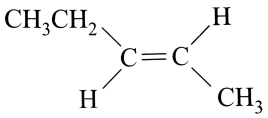
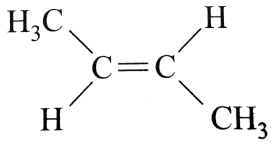
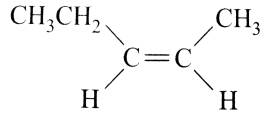
9. Which of the following has zero dipole moment?

A. 

B. 

C. 

D. 

Answer: C

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10. Which of the following compounds is the most reactive towards electrophilic addition reactions?

A. $CH_2 = CH_Cl$

B. $(CH_3)_2C = CH_2$

C. $CH_3CH = CH_2$

D. $CH_2 = CH_2$

Answer: B

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11. Hydroboration reactions are usually carried out in ethers. The reagent diborane is commercially available in

A. diethyl ether

B. diglyme

C. tetrahydofauran

D. All of these

Answer: C

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12. Which of the following methods is useful in preparing 1° alcohols form terminal alkenes?

A. Acid catalyzed hydration

B. Hydroboration oxidation

C. Oxymercuration-demercuration

D. Reaction with conc. H_2SO_4 followed by hydrolysis

Answer: B

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13. $C_3H_7CH=CH_2 \xrightarrow[THF/H_2O]{Hg(OAc)_2} A \xrightarrow[NaOH]{NaBH_4} B$

The compound B is

A. $C_3H_7CH_2CHO$

B. $CH_3H_7-\underset{\underset{O}{||}}{C}-CH_3$

C. $C_3H_7CH(OH)CH_3$

D. $C_3H_7CH_2CH_2OH$

Answer: C

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14. Propene reacts with $HOCl$ to give

A. $CH_3CHClCH_2OH$

B. $CH_3CH(OCl)CH_3$

C. $CH_3CHOHCH_2Cl$

D. $CH_3CH_2CH_2OCl$

Answer: C

Watch Video Solution

15. An alkene on ozonolysis produces butanone only. The alkene is

A. 2, 3-dimethylbut-2-ene

B. 2, 5-dimethylhex-2-ene

C. But-2-ene

D. 3, 4-dimethylhex-3-ene

Answer: D

Watch Video Solution

16. Which of the following gives on ozonolysis both aldehydes and ketones?

A. $Me_2C = CHMc$

B. $Me_2C = Cme_2$

C. $MeCH_2C(Me) = Cme_2$

D. $MeCH(Me)CH = CHMe$

Answer: A

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17. In the following sequence of reactions, the alkene affords the compound B:

$$CH_3CH = CHCH_3 \xrightarrow{O_3} A \xrightarrow[Zn]{H_2O} B$$

The compound B is

A. CH_3CHO

B. CH_3CH_2CHO

C. CH_3COCH_3

D. $CH_3CH_2COCH_3$

Answer: A

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18. $CH_3CH_2CH = CH_2 \xrightarrow{Catalyst} CH_3CH = CHCH_3$

The catalyst used in the above conversion is

A. $ZnCl_2$

B. $AlCl_3$

C. $PdCl_2$

D. $CuCl$

Answer: B

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19. The total number of alkenes possible having the molecular formula C_5H_{10} is

A. 4

B. 5

C. 6

D. 2

Answer: C

Watch Video Solution

20. Which of the following alkyl halides undergoes the fastest base-induced dehydrohalogenation?

A. t-Butyl bromide

B. Isobutyl bromide

C. iso-Butyl iodide

D. $t-$ Butyl iodide

Answer: D

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21. The major product from the reaction of 3-bromo-2, 3-dimethylpentane with al. KOH is

A. $(CH_3)_2C=C(CH_3)CH_2CH_3$

B. cis-$CH_3CH=C(CH_3)CH(CH_3)_2$

C. trans-$CH_3CH=C(CH_3)CH(CH_3)_2$

D. $H_2C=C(CH_2CH_3)CH(CH_3)_2$

Answer: A

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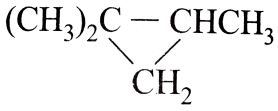
22. In the dehydration of $(CH_3)_3CHOHCH_3$, the major product is

A. $(CH_3)_3CCH = CH_2$

B. $CH_2 = \overset{CH_3}{\underset{|}{C}}\, CH(CH_3)_2$

C. $(CH_3)_2C = C(CH_3)_2$

D. 

Answer: C

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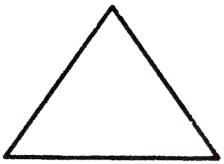
23. $1, 3$-Dibromopropane is allowed to react with magnesium (in excess) in dry ether. The product formed is

A. $CH_3CH = CH_2$

B. $BrMgCH_2CH_2CH_2MgBr$



C.

D. $BrMgCH_2CH_2CH_2Br$

Answer: C

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24. $(CH_3)_3CCH_2 - CBr(CH_3)_2 \xrightarrow{Heat}$

The major product is

A. $(CH_3)_3CCH_2C(CH_3) = CH_2$

B. $(CH_3)_3CCH = C(CH_3)_2$

C. $CH_2 = \underset{\underset{CH_3}{|}}{C} - \overset{\overset{CH_3}{|}}{C}HCH(CH_3)_2$

D. $(CH_3)_2C = \underset{\underset{CH_3}{|}}{C}CH(CH_3)_2$

Answer: A

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25. The Kolbe electrolytic method can be used to synthesize alkenes. It involves the electrolysis of a concentrated solution of the sodium or potassium salt of

A. a saturated carboxylic acid

B. an unsaturated carboxylic acid

C. an unsaturated dicarboxylic acid

D. a saturated dicarboxylic acid

Answer: D

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26. Ethylene is industrially prepared by

A. dehydrohalogentation

B. carcking of ethane

C. heating ehtanol with excess of concentrated sulphuric acid

D. electroysis of sodium succinate by the Kolbe method

Answer: B

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27. Addition of halogen to alkenes is predominantly

A. an anti addition

B. a syn addition

C. free radical addition

D. nonpolar addition

Answer: A

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28. The reaction of ethylene with Br_2 in water in the presence of $NaCl$ gives

A. 1, 2-dibromoethane

B. 1-bromo-2-chloroethane

C. 2-bromoethanol

D. All of these

Answer: D

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29. Which of the following statements is correct ?

A. but-2-ene reacts with HX at a rate faster than but-1-ene does.

B. But-1-ene reacts with HX at a rate faster than but-2-ene does.

C. In the absence of peroxides, but$-1-$ene but$-2-$ene react with Hbr to given two different products.

D. Both but$-1-$ene and but$-2-$ene react at the same rate.

Answer: D

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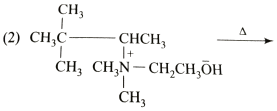
30. Which of the following reactions is expected to given a fairly good yield of $(CH_3)_3CCH=CH_2$?

A. $CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CHCH_3 \xrightarrow[\text{Acetone}]{zn} \underset{Heat}{}$

B. 

C. $CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CHCH_3 \xrightarrow[Heat]{H_2SO_4}$ (OH)

D. $CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CHCH_3 \xrightarrow[Heat]{(CH_3)_3CO^-K^+}$ (Br)

Answer: D

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31. Propene on reaction with ICI produces mainly

A. $(\pm) -$ 2-chloro-1-iodopropane

B. $(\pm) -$ 1-chloro-2-iodopropane

C. 2-chloro-1-iodopropane

D. 1chloro-2-iodopropane

Answer: A

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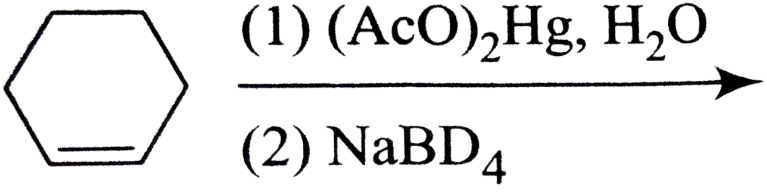
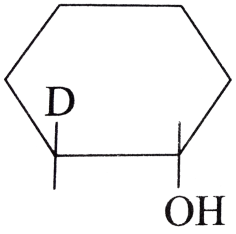
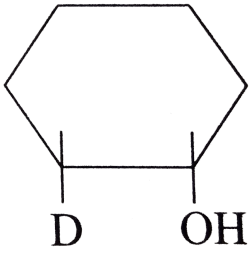


32.

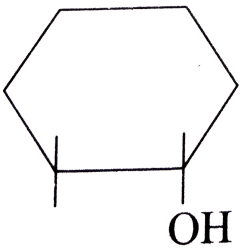
The product obtained is



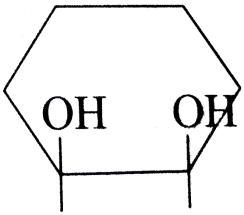
A. Racemic



B. Racemic



C.

D. 

Answer: A

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33. Ethylene reacts with $O_2 at 200^\circ C$ in the presence of silver powder to produce

A. ethanoic acid

B. oxirane

C. ethanal

D. ethanol

Answer: B

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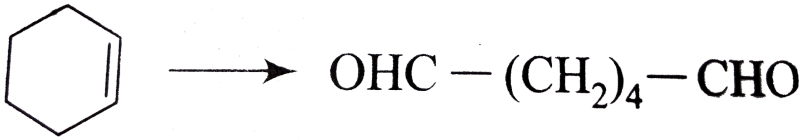
34. Select the reagent for the following reaction:



A. SeO_2

B. O_3, Zn / H_2O

C. $O_3 / H_2O_2 - CH_3CO_2H$

D. `PC C

Answer: B

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35. The bond dissociation of $C = C$ in ethene is

A. $63 kcal mol^{-1}$

B. $146 kcal mol^{-1}$

C. $88 kcal mol^{-1}$

D. $95 kcal mol^{-1}$

Answer: B

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36. In propylene, $H_2C = CH - CH_3$, the $C = C - C$ bond angle is

A. 120°

B. 121°

C. 124°

D. 126°

Answer: C

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37. Which of the following pairs of componds have the same general formula C_nH_{2n} ?

A. Alkenes and cycloalkynes

B. Alkenes and cycloalkenes

C. Alkenes and alkynes

D. Alkenes and cycloalkanes

Answer: D

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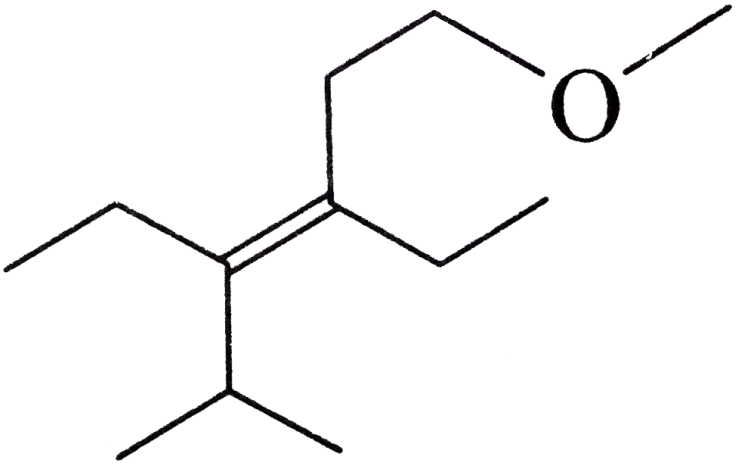
38. Consider the following derivative of an alkene:



Its correct $IUPAC$ names is

A. $(Z)-3$, 4-diethyl-6-methoxy-2-methylhex-3-ene

B. (E)$-$ 3,4-diethyl-6-methoxy-2-methylhex-3-ene

C. (Z)-3,4-diethyl-1-methoxy-5-methylhex-3-ene

D. (E)-3,4-diethyl-1-methoxy-5-methylhex-3-ene

Answer: D

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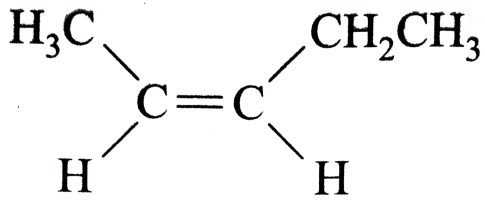
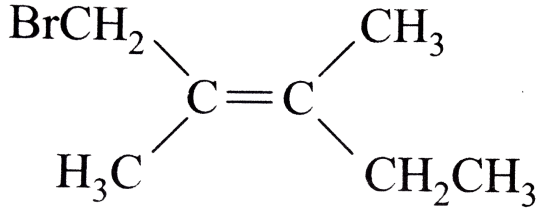
39. Which of the following compounds has Z configuration ?

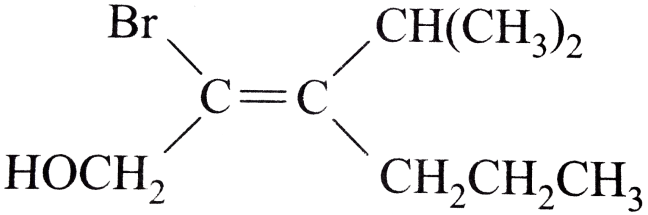
(i)



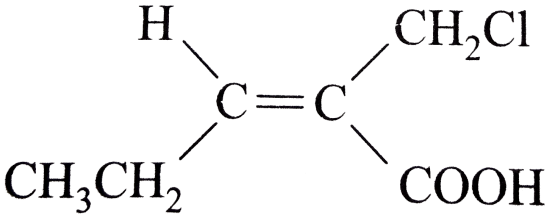
(ii)



(iii)



(iv)



(i)

A. (i),(iii)

B. (ii), (iv)

C. (i),(iv)

D. (ii),(iii)

Answer: A

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40. Which of the following exhibits geometrical isomerism?

A. $CH_3CH = C = CHCH_3$

B. $CH_3CH = C = C = CHCH_3$

C. $CH_3CH = C = C = CH_2$

D. $(CH_3)_2C = C = C = C(CH_3)_2$

Answer: B

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41. How many different alkenes are formed when isobutyl alcohol is subjected to acid catalyzed dehydration?

A. Three

B. Four

C. Two

D. Only one

Answer: B

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42. When..... is used as the deydrating agent, the yield of 1-alkenes from 2-alcohols (such as butan -2-ol)is generally above 98% .

A. H_2SO_4

B. H_3PO_4

C. Al_2O_3

D. ThO_2

Answer: D

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43. In the reaction

$$CH_3CH_2CH_2 - \overset{CH_3}{\underset{CH_3}{\overset{|}{\overset{+}{N}}}} - CH_2CH_3OH^- \xrightarrow{\Delta}$$

which of the following is formed in the largest amount?

A. $CH_2 = CH - CH_3$

B. $CH_2 = CH_2$

C. Both (1) and (2) are formed in equimalor amounts

D. No alkene is formed

Answer: B

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44. Which of the following compounds are used to synthesize alkenes through the Wittig reaction?

A. Aldehydes

B. Ketones

C. Both (1) and (2)

D. Carboxylic acids

Answer: C

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45. Which of the following statements is true about the electrolysis of aqueous sodium succinate?

A. It involves electrochemical oxidation of the succinate ion at the anode.

B. It proceeds according to free-radical mechanism.

C. It involves decarboxylative elimination

D. All of these

Answer: D

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46. $1,2$-Dimethylcyclopentene in heated with $H_2\mathbb{N}H_2$ (hydrazine) and an oxidant $(H_2O_2$. The product is

A. exclusively cis-$1,2$-dimethylcyclopentane

B. exclusively trams-$1,2$-dimethylcyclopentane

C. an equimolar mixtue of (1) and (2)

D. an unequal mixture of (1) and (2)

Answer: A

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47. Propene on reaction with $Br_2 \text{in} CCl_4$ yields

A. 3-bromopropane

B. cis-1, 2-dibromopropane

C. trans-1, 2-dibromopropane

D. $(\pm)1$, 2-dibromopropane

Answer: D

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48. But-1-ene on reaction with HCl produces

A. $(+)-$ 2-chlorobutane

B. $(-)-$ 2-chlorobutane

C. $(\pm)1$, 2-chlorobutane

D. 1-chlorobutane

Answer: C

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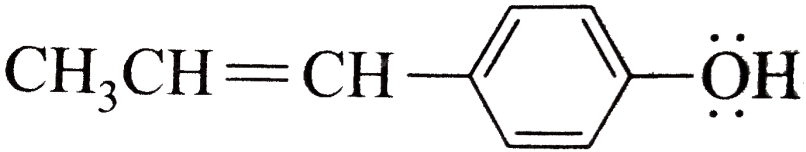
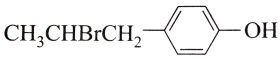
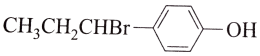
49. The reaction of

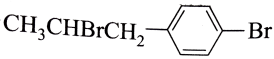


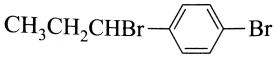
with HBr

gives

A. 

B. 

C. 

D. 

Answer: B

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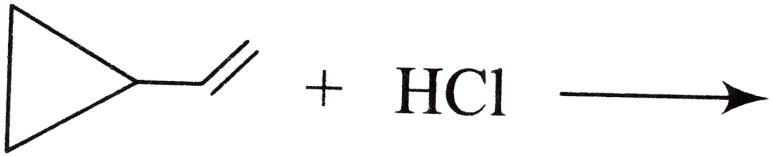
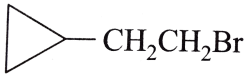
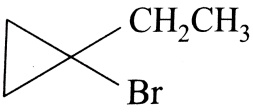
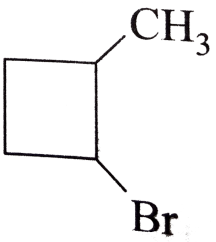
50. The major product formed in the following reaction is



A. 

B. 

C. 

D. 

Answer: D

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51. Great care must be taken in handling diborane and alkylboranes because they ignite spontaneously in air with a flame.

A. blue

B. yellow

C. green

D. red

Answer: C

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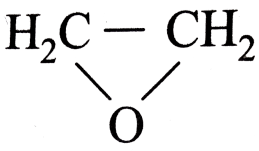
52. $CH_2 = CH_2 \xrightarrow{HOCl} A \xrightarrow{dil.NaOH} B$

The final product B formed in the above reaction is

A. $HOCH_2CH_2OH$

B. 

C. $ClCH_2CH_2Ona$

D. $ClCH_2CH_2OH$

Answer: B

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53. Ethylene is alkylated with $(CH_3)_3$ using HF to give, chiefly,

A. $CH_3CH_2\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}}-CH_3$

B. $CH_3CH_2CH_2CH(CH_3)_2$

C. $(CH_3)_2CHCH(CH_3)_2$

D. $CH_3CH_2\underset{\underset{CH_3}{|}}{C}HCH_2CH_3$

Answer: C

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54. Mustard gas is prepared by the reation of ethylene with

A. sulphur dichloride

B. sulphur dichloride

C. sulphur tetrachloride

D. sulphur hexafluroride

Answer: A

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55. The catalyst used in the manufacture of polythene by the Ziegler process is

A. $TiCl_4$

B. $(C_2H_5)Al$

C. a mixture of (1) and (2)

D. $(C_6H_5)Al$

Answer: C

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Archives

1. In the reaction below, X is

Neopentyl alcohol $\xrightarrow{H_2SO_4} X$

A. 2-methylpentane

B. 2-methylpent-2-ene

C. 2-methybut-2-ene

D. Neopentane

Answer: C

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2. $CH_3\underset{\underset{CH_3}{|}}{C}HCH=CH_2 \xrightarrow{HBr} A$

A (predominantly) is

A. $CH_3\underset{\underset{CH_3}{|}}{\overset{\overset{Br}{|}}{C}}HCH(Br)CH_3$

B. $CH_3\underset{\underset{CH_3}{|}}{C}CH_2CH_3$

C. $BrCH_2CH_2\underset{\underset{CH_3}{|}}{C}HCH_3$

D. $BrCH_2\underset{\underset{CH_3}{|}}{C}HCH_2CH_3$

Answer: B

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3. Which of the following compounds with molecular formula C_5H_{10} yields acetone on ozonolysis?

A. 2-Methylbut-1-ene

B. 2-Methylbut-2-ene

C. 3-Methybut-1-ene

D. Cyclopentane

Answer: B

View Text Solution

4. The major product formed when $3,3$-dimethylbutan-2-ol is heated with concentrated sulphuric acid is

A. $2,3$-dimethylbut-2-ene

B. $2,3$-dimethylbut-1-ene

C. $3,3$-dimethylbut-1-ene

D. cis and trans isomers of $2,3$-dimethylbut-1-ene

Answer: A

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5. Oxidation of an alkene (X) gives a diol. Further oxidation gives a diketone. Which one of the following could be X?

A. $(CH_3)_2C = C(CH_3)_2$

B. $CH_3CH = C(CH_3)_2$

C. $CH_3CH = CH_2$

D. $C_6H_5CH = CHC_6H_5$

Answer: D

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6. The number of σ and π- bonds in alkyl isocyanide are

A. $9\sigma, 3\pi$

B. $9\sigma, 9\pi$

C. $3\sigma, 4\pi$

D. $5\sigma, 7\pi$

Answer: A

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7. One mole of an unsaturated hydrocarbon on ozonolysis gives one mole each of $CH_3CHO, HCHO,$ and $OCH - CHO$. The hydrocarbon is

A. $CH_3CH_2C \equiv CCH_3$

B. $CH \equiv CCH_2CH_2CH_3$

C. $CH_3CH = CHCH = CH_2$

D. $CH_2 = CHCH_2CH = CH_{(2)}$

Answer: C

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8. Relative stabilities of various alkenes represented as $R_2C = CR_2$, $R_2C = CHR$, $RCH = CHR$ (trans), $RCH = CHR(cis)$ are in the increasing order

A.

$$R_2C = CR_2, R_2C = CHR, RCH = CHR(trans), RCH = CHR(c$$

B.

$$R_2C = CR_2, R_2C = CHR, RCH = CHR(cis), RCH = CHR(tra$$

C.

$$RCH = CHR(trans), RCH = CHR(cis), R_2C = CHR, R_2C = C$$

D.

$$RCH = CHR(cis), RCH = CHR(trans), R_2C = CHR, R_2C = C$$

Answer: D

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9. 3-Phenylpropene on reaction with HBr gives (as major product)

A. $C_6H_5CH_2CH(Br)CH_3$

B. $C_6H_5CH(Br)CH_2CH_3$

C. $C_6H_5CH_2CH_2Br$

D. $C_6H_5CH(Br)CH=CH_2$

Answer: B

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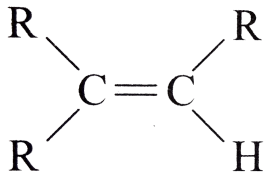
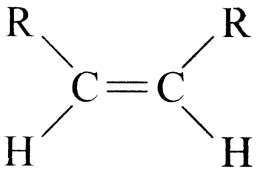
10. Which of the following alkenes will react fastest with H_2 under catalytic hydrogenation conditions

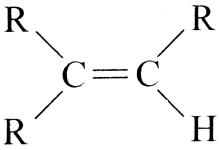
A.



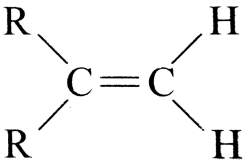
B.



C.



D.



Answer: B

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11. Reaction of HBr with propane in the presence of peroxide gives

A. isopropyl bromide

B. 3-bromopropane

C. allyl bromide

D. n-propylbromide

Answer: D

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12. The compound $CH_3 - \overset{CH_3}{\underset{|}{C}} = CH - CH_3$

on reaction with $NalO_4$ in the presence of $KMnO_4$ gives

A. $CH_3 - CHO + CO_2$

B. CH_3COH_3

C. $CH_3COCH_3 + CH_3COOH$

D. $CH_3COCH_3 + CH_3CHO$

Answer: C

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13. Prop-1-ol can be prepared from propene

A. H_2/H_2SO_4

B. $Hg(OAC)_2 / H_2O$ followed by $NaBH_4$

C. B_2H_6 followed by H_2O_2

D. CH_3COOH / H_2SO_4

Answer: C

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14. The reaction of HBr with $CH_3\underset{CH_3}{\overset{|}{C}}=CH_2$ in the presence of peroxide will give

A. $CH_3-\underset{CH_3}{\overset{Br}{\overset{|}{\underset{|}{C}}}}-CH_3$

B. $CH_3CH_2CH_2CH_2Br$

C. $CH_3\underset{CH_3}{\overset{|}{C}}HCH_2Br$

D. $CH_3CH_2\underset{\underset{Br}{|}}{C}HCH_3$

Answer: C

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15. Hydrolysis of ozonide of but-1-ene gives

A. ethylene only

B. acetaldehyde and fromaldehyde

C. propionaldehyde and formaldehyde

D. acetaldehyde only

Answer: C

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16. Monomer of $\left[- \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - CH_2 - \right]_n$ *is*

A. 2-methypropene

B. styrene

C. propylene

D. ethene

Answer: A

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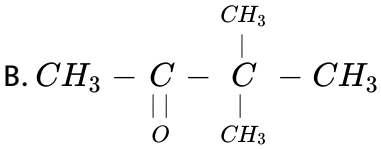
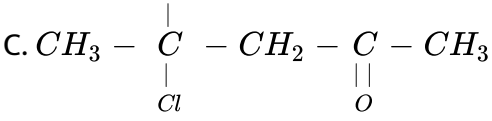
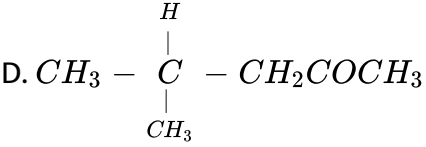
17. Indicate the organic structure for the product expected when 2-methylpropene is heated with acetyl chloride in the presence of anhydrous $ZnCl_2$.

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

B. 

C. 

D. 

Answer: C

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18. In the preparation of alkene from alcohol using Al_2O_3, which is effective factor?

A. Porosity of Al_2O_3

B. Temperature

C. Concentration

D. Surface area of Al_2O_3

Answer: D

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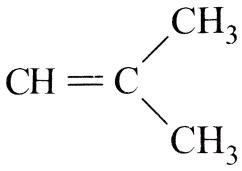
19. Which alkene on ozonolysis gives CH_3CH_2CHO and CH_3COCH_3?

A. 

B. $CH_3CH_2CH = CHCH_2CH_3$

C. $CH_3CH_2CH = CHCH_3$

D. $CH_3\underset{\underset{CH_3}{|}}{C} = CHCH_3$

Answer: A

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20. Ozonolysis of C_7H_{14} gace 2-methylpentan-3-one. The alkene is

A. 2-ethyl-3-methylbut-1-ene

B. 3-ethyl-2-methylbut-3-ene

C. 2, 5-dimethyl-3, 4-dimethylhex-3-ene

D. 3-ethyl-2-methylbut-1-ene

Answer: A

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21. Buta-1, 3-diene when treated with Br_2 gives

A. 1, 4-dibromobut-2-ene

B. 1, 3-dibromobut-2-ene

C. 3, 4-dibromobut-1-ene

D. 2, 3-dibromobut-2-ene

Answer: A

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22. The addition of HBr is the easiest with

A. $CH_2 = CHCl$

B. $ClCH = CHCl$

C. $CH_3CH = CH_2$

D. $(CH_3)_2C = CH_2$

Answer: D

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23. The $IUPAC$ name of the compound having the formula $(CH_3)_3C - CH = CH_2$ is

A. 1, 1-dimethylbut-3-ene

B. 1, 1, 1-trimethylprop-3-ene

C. 3, 3-dimethylbut-1-ene

D. 3, 3-dimethylprop-1-ene

Answer: C

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24. The prinicipal organic product formed is the reaction :

$$CH_2 = CH(CH_2)_8COOH + HBr \xrightarrow{\text{Peroxide}}$$

is

A. $CH_3CHBr(CH_2)_8COOH$

B. $CH_2 = CH(CH_2)_8COBr$

C. $CH_2BrCH_2(CH_2)_8COOH$

D. $CH_2 = CH(CH_2)_7CHBrCOOH$

Answer: C

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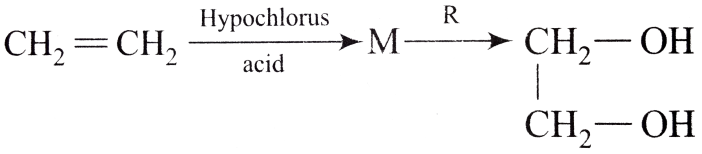
25. In the reaction

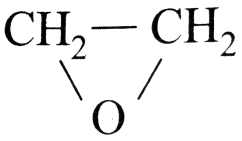


M and R

A. CH_3CH_2Cl and $NaOH$

B. CH_2ClCH_2OH and aq. $NaHCO_3$

C. CH_3CH_2OH and HCl

D. 

Answer: B

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26. The presence of unsaturation in organic compounds can be tested with

A. Schiff's reagent

B. Tollen's reagent

C. Fehling's reagent

D. Baeyer's reagent

Answer: D

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27. A hydrocarbon reacts with hypochlorous acid to give 2-chloroethanol. The hydrocarbon is

A. ethylene

B. methane

C. ethane

D. acetylene

Answer: A

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