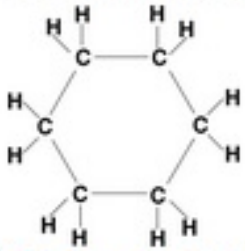
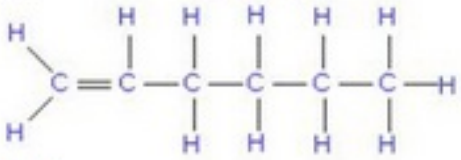
Solution 60
(a) Element X : Carbon
(b) Allotrope Y: Graphite
(c) Y is a good conductor of electricity.
(d) Y is used for making graphite electrodes or carbon electrodes in dry cells.
(e) Allotropes of X: Diamond and buckminsterfullerene
Solution 61

(a) A is cyclohexane, C_6H_{12}



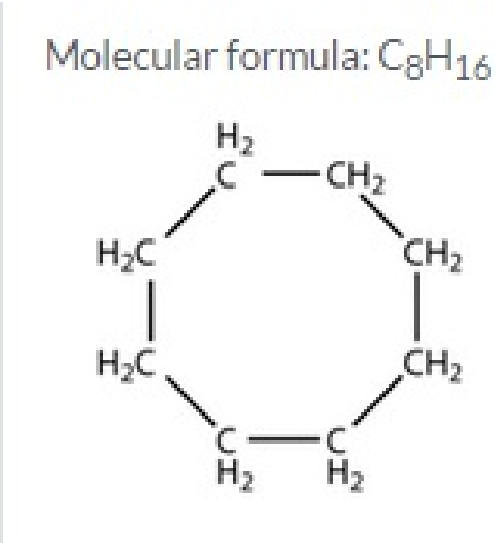
(b) B is hexene, C_6H_{12}



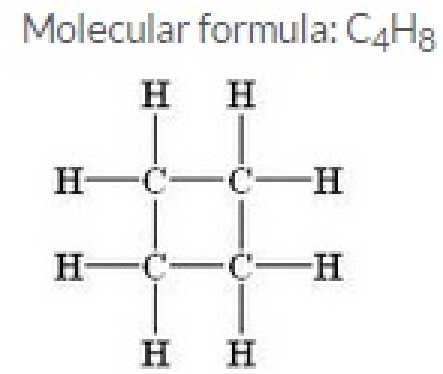
(c) B
(d) A

Solution 62
(a) Element A: Carbon
(b) Gas B: Carbon dioxide
(c) Allotrope C: Diamond
(d) Used for making jewellery
(e) Buckminsterfullerene
(f) Graphite
Solution 63
(a) Element E: Carbon
(b) Allotrope A: Buckminsterfullerene
(c) Allotrope B: Graphite
(d) Allotrope C: Diamond
(e) C
(f) B
Solution 64
(a) C_6H_{12}
(b) C_6H_6
(c) C_7H_{14};
C_5H_{10}; C_6H_{12}
(d) C_5H_8;
C_7H_{12}
(e) C_7H_{14};
C_5H_{10}; C_6H_{12}
Solution 65
C_3H_4
Solution 66

Molecular formula: C_8H_{16}



Solution 67
Molecular formula: C_4H_8



Solution 68
(i) $C_{20}H_{42}$
(ii) $C_{20}H_{40}$ (iii) $C_{20}H_{38}$
Solution 69
C_5H_{10}
Solution 70
C_3H_4

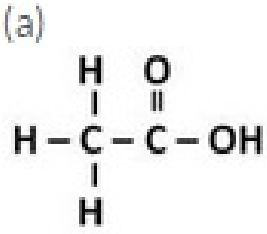
Solution 1
C_2H_5OH
Solution 2
Ethanol (C_2H_5OH)
Solution 3
Alcohol group; Methanol
Solution 4
Common name: formaldehyde
IUPAC name: methanal
Solution 5
Formaldehyde
Solution 6
(i) Alkyne
(ii) Alkene
Solution 7
Propanone
Solution 8
Acetone
Solution 9
(i) Propanone
(ii) Butanone
Solution 10
Formic acid; HCOOH

Solution 11

IUPAC name	Common name	Formula
(i) Methanoic acid	Formic acid	HCOOH
(ii) Ethanoic acid	Acetic acid	CH_3COOH

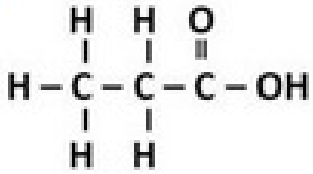
Solution 12
(a) Methanoicacid - Formic acid
(b) Ethanoic acid - Acetic acid
Solution 13

(a)



Ethanoic acid

(b)



Propanoic acid

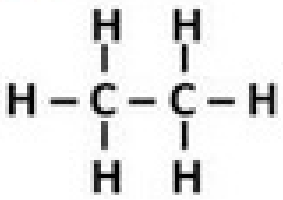
Solution 14

Formula	IUPAC name	Common name
(i) HCOOH	Methanoic acid	Formic acid
(ii) CH_3COOH	Ethanoic acid	Acetic acid

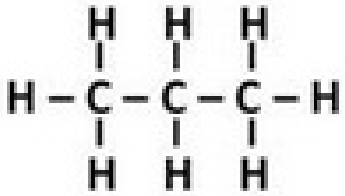
Solution 15
Ethanoic acid; CH_3COOH
Solution 16
(a) Methanoic acid: HCOOH
(b) Ethanoic acid: CH_3COOH
Solution 17
Common name: Ethyl alcohol
IUPAC name: Ethanol
Solution 18
Propanol, C_3H_7OH
Solution 19
Ethanol; C_2H_5OH
Solution 20
(a) Butanol, C_4H_9OH
(b) Pentanol, $C_5H_{11}OH$
Solution 21
Methyl alcohol
Solution 22
(i) 14 u
(ii) Two consecutive homologues differ by 1 carbon atom and 2 hydrogen atoms in their molecular formulae.
Solution 23
(a) Fuels which vaporise on heating, burn with a flame.
(b) Fuels which do not vaporise on heating, burn without a flame.
Solution 24
False

Solution 25
(a) Propanol
(b) C_3H_7OH
(c) Propane
(d) -OH (alcohol)
(e) Carboxylic acids
Solution 26
(a) Alkynes, C_nH_{2n-2}
First member: Ethyne
(b) Second member: C_3H_6
Fourth member: C_5H_{10}
(c) Third member: C_3H_8
Fifth member: C_5H_{12}
Solution 27
(a)

(a)



Ethane

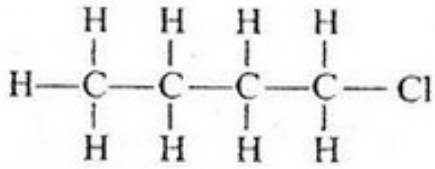


Propane

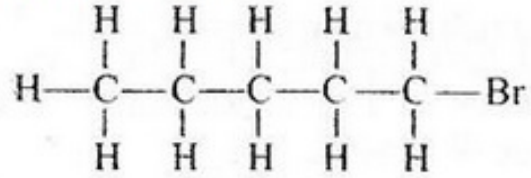
(b) Alkyne; C_nH_{2n-2}
(c) Alkanes: C_3H_8, C_4H_{10}
Alkenes: C_5H_{10}, C_8H_{16}
Alkynes: C_6H_{10}, C_7H_{12}

Solution 28
(a) (i) C_4H_8 (ii) C_3H_8
(iii) C_3H_4
(b) 14 u
(c) 1 carbon atom and 2 hydrogen atoms i.e. a CH_2 group.
Solution 29
Solution 30

(a) IUPAC name: Chloromethane
Common name: Methyl chloride
(b) Chlorobutane:



(c) Bromopentane:



Yes, structural isomers are possible for bromopentane.

Solution 31

(a) Acetone - CH_3COCH_3

(b) (i) Chloromethane - CH_3Cl

(ii) Chloroethane - C_2H_5Cl

(iii) Chloropropane - C_3H_7Cl

(c) Ethylbromide

(a) Ketones

(b) CH_3COOH

(c) Formaldehyde

Solution 33

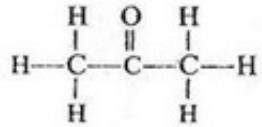
(a) A homologous series is a group of organic compounds having similar structures and similar chemical properties in which the successive compounds differ by CH_2 group.
Ethyl alcohol: C_2H_5OH

Ethyl Alcohol

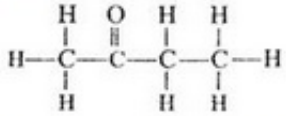
(b) C_3H_7OH
(c) Coal and petroleum

Solution 34

(a) (i) Propanone



(ii) Butanone

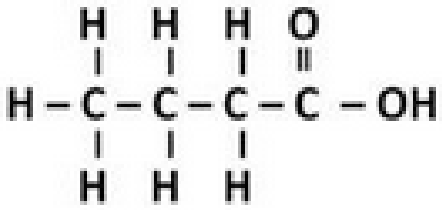


(b) (i) Methanal (ii) Ethanal (iii) Propanal (iv) Butanal
(c) Alcohol group, -OH; C_4H_9OH

Solution 35

(a) CH_3COOH: Ethanoic acid
CH_3CHO: Ethanal
CH_3OH: Methanol

(b)



Butanoic acid

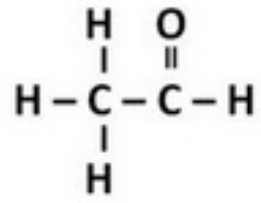
(c) Ethanoic acid.

Solution 36

(a) Carboxylic acid group, -COOH; C_4H_9COOH
(b) (i) Ethanal - CH_3CHO
(ii) Methanol - CH_3OH
(iii) Ethanoic acid - CH_3COOH
(iv) Chloromethane - CH_3Cl
(c) (i) Ethene: $CH_2 = CH_2$
(ii) Ethyne: $CH \equiv CH$

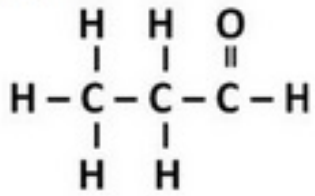
Solution 37
(a) $C_5H_{12}O$ or $C_5H_{11}OH$
(b) (i) Aldehyde group
(ii) Alcohol group
(iii) Carboxylic acid group
(iv) Ketone group
(v) Halo group
(c) When a candle is lighted, the wax melts, rises up the wick and gets converted into vapours. In a candle, there is no provision for the proper mixing of oxygen (of air) for burning wax vapours. So, the wax vapours bum in an insufficient supply of oxygen (of air) which leads to incomplete combustion of wax. This incomplete combustion of wax produces small unburnt carbon particles. These solid carbon particles rise in the flame, get heated and glow to give out yellowish light. This makes the candle flame yellow and luminous.
Solution 38
(a) A homologous series is a group of organic compounds having similar structures and similar chemical properties in which the successive compounds differ by CH_2 group.
Example of Homologous series: All the alkanes have similar structures with single covalent bonds and show similar chemical properties, so they can be grouped together in the form of a homologous series.
Homologous series of alkanes: Methane, CH_4; Ethane, C_2H_6; Propane, C_3H_8; Butane, C_4H_{10}; Pentane, C_5H_{12}
(b) (i) All the members of the homologous series can be represented by the same general formula.
(ii) Any two adjacent homologues differ by 1 carbon atom and 2 hydrogen atoms in their molecular formulae.
(c) Alkene, C_nH_{2n}
(d) Alkanes: CH_4, C_2H_6, C_4H_{10}?

Alkenes :C_2H_4, C_3H_6
Alkynes : C_2H_2, C_3H_4
(e) In an organic compound, any atom other than carbon and hydrogen is called a heteroatom.
Example: Chlorine (Cl), Bromine (Br), Oxygen (O)
Chloromethane - CH_3Cl and methanol - CH_3OH
Solution 39
(a) An 'atom' or 'a group of atoms' which makes a carbon compound (or organic compound) reactive and decides its properties (or functions) is called a functional group. The alcohol group, -OH, present in ethanol, C_2H_5OH, is an example of a functional group.
(b) (i) Halo group: -X
(ii) Alcohol group: -OH
(iii) Aldehyde group: -CHO
(c) (i) Carboxylic acid group
(ii) Aldehyde group
(iii) Alcohol group
(iv) Ketone group
(d) Ketone group, -CO-
(e) (i)



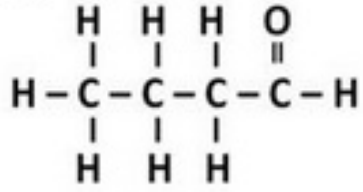
Ethanal

(ii)



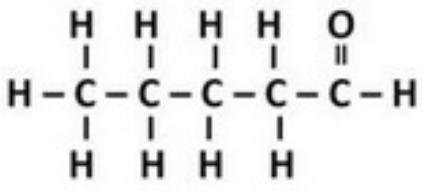
Propanal

(iii)



Butanal

(iv)



Pentanal

Solution 40

(a) When carbon is burned in air, it forms carbon dioxide gas and releases a large amount of heat and some light:

$C + O_2 \rightarrow CO_2 + Heat + Light$

(b) Coal and petroleum are called as fossil fuels because they were formed by the decomposition of the remains of the pre-historic plants and animals (fossils) buried under the earth long, long, ago.

(c) Coal was formed by the decomposition of large land plants and trees buried under the earth millions of years ago. It is believed that millions of years ago, due to earthquakes and volcanoes, etc., the forests were buried under the surface of the earth and got covered with sand, clay and water. Due to high temperature and high pressure inside the earth, and in the absence of air, wood was converted into coal.

(d) Petroleum oil (and natural gas) was formed by the decomposition of the remains of extremely small plants and animals buried under the sea millions of years ago. It is believed that millions of years ago, the microscopic plants and animals which lived in seas, died. Their bodies sank to the bottom of the sea and were soon covered with mud and sand. The chemical effects of pressure, heat and bacteria, converted the remains of microscopic plants and animals into petroleum oil and natural gas just as they converted forest trees into coal. This conversion took place in the absence of oxygen or air. The petroleum thus formed got trapped between two layers of impervious rocks (non-porous rocks) forming an oil trap.

(e) Natural gas.

********** END **********