

$$(II) 14 + 14 = 28 \quad n = \frac{42000}{28}$$

$$n = 1500$$

(b) C_2H_4 burns with more smoky luminous flame than C_2H_6 because of higher percentage of carbon atoms / C_2H_4 is unsaturated whereas C_2H_6 is saturated

9. 1992 Q8

N/A

10. 1992 Q11

$CH_3CH_2CH=CHCH_3$ / 2-pentene or pent-2-ene

11. 1992 Q13

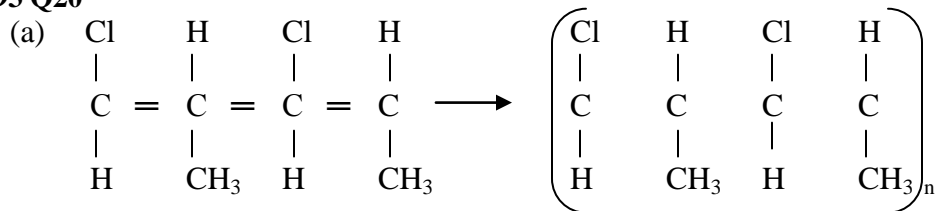
(a) $1\text{---}CH_2\text{---}CH\text{---}n$

(b) $CH_2=CH$

12. 1992 Q23

Hexane has a higher molecular formula than methane / hexane has stronger intermolecular forces than methane molecules

13. 1993 Q20



(b) polychloropropene

14. 1993 Q25

(a) (i) homologous

(ii) alkenes

(iii) C_2H_4 / C_4H_8 / C_3H_8 Reason- the boiling point is lower than that of room Temperature

(iv) C_8H_{16}

(v) boiling point increases with increase in molecular mass, intermolecular forces / vanderwaal forces increase

(b) acidified $KMnO_4$ is decolourised Reason – all the compounds are unsaturated/have double bond/undergoes addition reaction / reduces the permanganate to manganese ions

(c) X = C_2H_5OH or CH_3CH_2OH

Z = C_2H_5Cl or CH_3CH_2Cl

Y = dehydration

15. 1994 Q12

(a) substitution/halogenations / chlorination

(b) uv light or sunlight or diffuse sunlight

16. 1994 Q21

- (a) sulphur
(b) to harden it/make it stronger or tougher

17. 1994 Q24

- (a) $(\text{RCOO}^-)_2 \text{Ca}^{2+}$ is more soluble in water than $(\text{RCOO}_2^-) \text{Ca}^{2+}$ thus the cleansing agent
(b) $(\text{RC}_6\text{H}_5\text{SO}_3^-)\text{Ca}^{2+}$ is a better cleansing agent in hard water

18. 1994 Q25

- (a) Butanol $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$ /
- $$\begin{array}{cccc} \text{H} & \text{H} & \text{H} & \text{H} \\ | & | & | & | \\ \text{H} - \text{C} & - \text{C} & - \text{C} & - \text{C} - \text{OH} \\ | & | & | & | \\ \text{H} & \text{H} & \text{H} & \text{H} \end{array}$$
- (b) $\text{C}_4\text{H}_9\text{OH} + 6\text{O}_2 \longrightarrow 4\text{CO}_2 + 5\text{H}_2\text{O}$

19. 1995 Q5 P1

- a) sisal/ Cotton/ wool/ silk /jule/hemp/fur/hair (1mark)
b) They are stronger than natural fibres/OR are not easily affected by chemicals/lasts longer /durable/ can be produced easily in a large scale therefore cheaper (Reject. Strong bonds) (1mark)

20. 1995 Q16 P1

a)

Alkane	Formula	Heat of combustion (ΔH_c) kJmol^{-1}
Methane	CH_4	- 890
Ethane	C_2H_6	- 1560
Propane	C_3H_8	- 2220
Butane	C_4H_{10}	- 2870 – 2880($^{1/2}$)

(Correct answer only –ve sign)

(award full mark if figure is not \pm)

$$2220 - 1560 = 660$$

$$1560 - 890 = 670$$

$$2220 + 650 = 2870$$

(Accept any value 2870)Any calculation

(1mark)

- b) ΔH_c is an exothermic reaction.

(1mark)

21. 1995 Q27 P1

- $\text{Ca}(\text{OH})_2(\text{aq})$ forms white precipitate ($^{1/2}$) with CO_2 Can be observed $\text{NaOH}(\text{aq})$
does not form a precipitate. (1mark)

22. 1996 Q9 P1

- Add solid hydrogen carbonate; CH_3COOH produces effervescence; while $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ does not (Accept any other carbonate that behaves)

23. 1996 Q13 P1

I, production of carbon dioxide or carbon is oxidized to its highest oxidation number/carbon dioxide cannot burn further or carbon dioxide cannot burn further or carbon monoxide can burn further.

24. 1996 Q25 P1



$$\text{R.M.M of monomer} = 36+3+14 = 53$$

$$\text{No. of monomer} = \frac{5194}{53}$$

25. 1996 Q28 P1

Pentane, because the peplanoic acid would react with the sodium hydroxide.

26. 1996 Q10 P1

The ionic end lowers the surface tensions of water, facilitating mixing while the non-ionic end (non-polar end) mixes with grease, dislodging it from the fabric.

27. 1997 Q3 P1

Name of polymer	Name of monomer	One use of the polymer
Polystyrene	Styrene (Phenylethene)	Insulation, plastic pipes, Biro, Artificial rubber, car tyres manufacture of plastics
Polymethyl chloride Polychloroethane polychloroethane	Vinyl chloride (chloroethane)	Insulation of electric cables, plastics, plate cups, pipes, making plastic tiles, plastic water tanks

28. 1997 Q5 P1

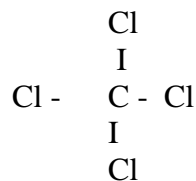
- B

Give a reason

- B does not form scum / A forms scum
- B is soapless detergent

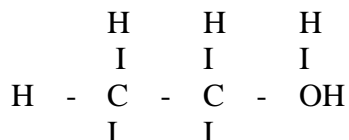
29. 1997 Q12 P1

- Tetrachloromethane/ carbon tetrachloride

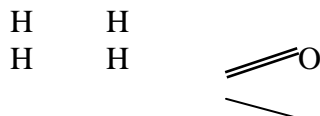


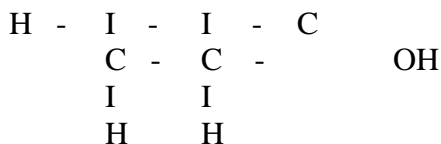
30. 1998 Q14 P1

(a) Ethanol



(b) Propanoic

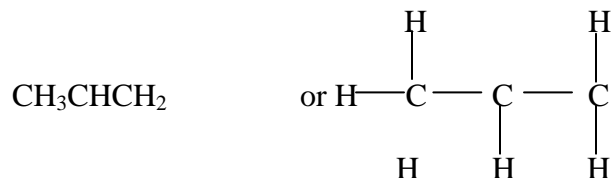




(c) – Ethylpropanoate

36. 2000 Q9 P1

a)



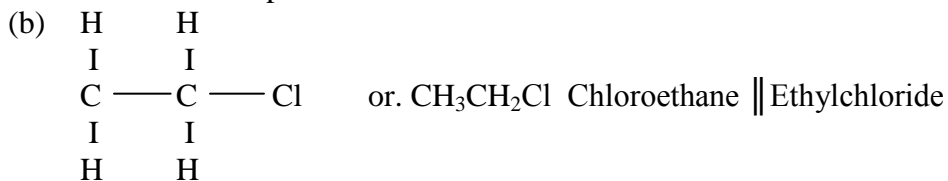
b) Propane or prop – 1 – ene

37. 2000 Q20 P1

Add water to the mixture in a separating funnel. Ethanol dissolves while pentane does not. Allow the mixture to separate in two layers. Open the tap to drain the lower aqueous layer. Distil the water ethanol mixture to get ethanol.

38. 2001 Q18 P1

(a) The idea of being replaced by a halogen || reaction where one hydrogen atom of an alkane is replaced.



39. 2002 Q17 P1

a) Perspex (10)

b) As a substitute for glass in the manufacture of

- safety screens
- plastic lenses
- Wind screen Accept any other correct use.

40. 2002 Q25 P1

a) Butane (1)

b) Hardening of oils in the (a) manufacture of margarine

(2 marks)

41. 2002 Q1a P2

(a) Distillation/ Fractional distillation

42. 2003 Q8 P1

a) The heat absorbed by a substance as it changes from liquid state to gaseous state at constant temperature.

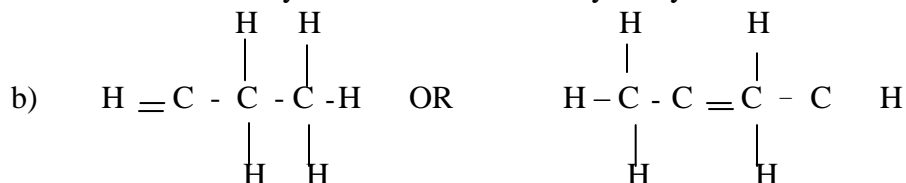
b) Boiling point increases with increase in molecular mass / c- atoms / c- bonds

43. 2003 Q23 P1

- a) Bromine is decolorized (colorless)
 b) 1, 2 –dibromopentane or 2, 3 dibromopentane

44. 2003 Q7 P2

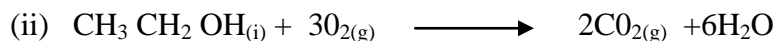
- a) Ethane burns with a pale blue flame while ethane burns with a yellow flame.
 Ethane is saturated while ethyne is unsaturated. OR Ethane burns with a non smoky flame while ethyne burns with a Smokey/sooty flame.



- c) (i) I Oxidation

II B -Ethane

C - Sodium ethanoate.



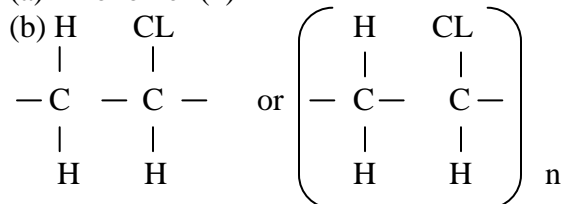
- (iii) to bring the reacting particles in close contact for the reaction to occur.

- (d)(iv) -Fuel

- Manufacturer of carbon black used in making paint and paint ink
- Manufacture of hydrogen gas
- Manufacture of carbon disulphide
- Manufacture of chloromethane, tetra chloromethane
- Manufacture of hydrogen used in manufacture of ammonia
- Manufacture of hydrogen cyanide
- Manufacture of ethyne.

45. 2004 Q13 P1

- (a) Monomer (1)



46. 2004 Q15 P1

- a) = Test tube 1: There is effervescence (1/2) bubbler/ dissolved
 Test tube 2: No effervescence (1/2) no observable change/dissolved
 Ethanoic acid ionizes in water (1)
 H reacts with CO_3^{2-} to form CO_2 (1)

- b) In Hexane ethanoic acid exists in form of molecules. No reaction with carbonate or acid does not ionize in balance. (3marks)

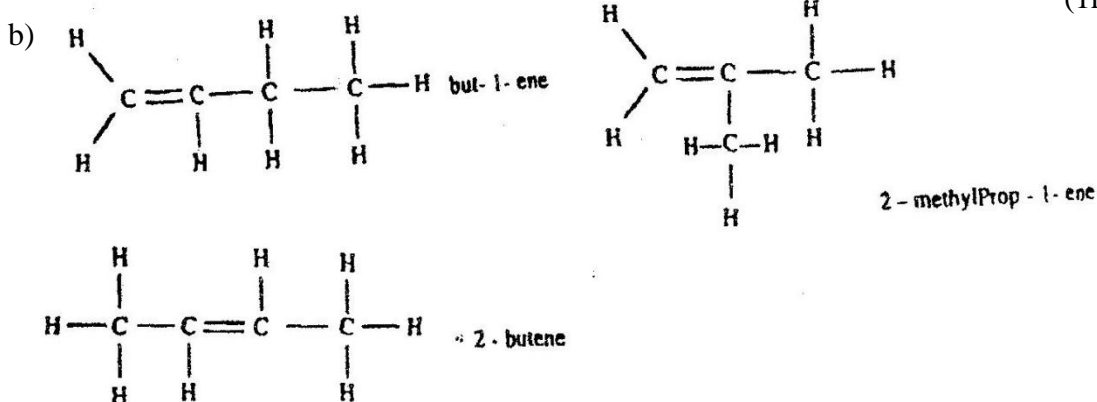
47. 2005 Q1 P1

Used in the manufacture of glass, treatment of hard water, making of baking powder preservation of soft drinks etc. (1mark)

48. 2006 Q1 P1

a) Compounds with the same molecular formula but different structural formulae.

(1mark)



49. 2006 Q10c p1

Polymerisation

(1mark)

50. 2006 Q23 P1

In addition to van der waals forces, strong hydrogen bonds exist in ethanol.

These bonds require more energy to break

(2marks)

51. 2006 Q5 P2

a) Hydrocarbon

(1mark)

b) i) Fractional distillation.

(1mark)

ii) Fuel solvent / source of H₂ gas

(1mark)

c) i) L = Calcium carbide, CaC₂

(1mark)

ii) Phosphoric acid / aluminium oxide / H₂SO₄

(1mark)

iii) H - C ≡ C - H

(1mark)

iv) Hydrolysis or hydration or Oxidation

(1mark)

iv) I

- Making rain coats.
- Plastic water pipes
- Electrical insulation
- Floor tiles.

(1mark)

II Hardening of oils to form fats/ margarine manufacture

(1mark)

d) i) $\text{CH}_3\text{COOH}_{(\text{aq})} + \text{NaOH}_{(\text{aq})} \longrightarrow \text{CH}_3\text{CO} - \text{ONa}_{(\text{aq})} + \text{H}_2\text{O}_{(\text{l})}$

(1mark)

ii) HCl is fully dissociated while ethanoic acid dissociates partially
∴ Ethanoic acid is weak while HCL is strong

(2marks)

52. 2007 Q13 P1

(a) (i) Deliquescency

(ii) Esterification

(iii) Thermal cracking

53. 2007 Q23 P1

Pentene -1Al is polar. There are two forces, Vanderwaals and hydrogen bonds holding its molecules together. Pentene is non- polar.

54. 2008 Q6 P1

Propanol Propan - I - ol

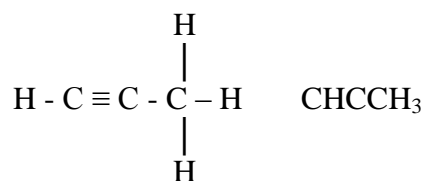
Butanoic acid

Are elements with the same atomic number but different masses

Are different elements with the same atomic no but different masses

55. 2008 Q5 P2

(a)



(b) (i) Heat temperature $\geq 400\text{k}$
Catalyst temperature $\geq 700\text{k}$

(ii) Ethane, CH_3CH_3 , C_2H_6

(iii) I Pollutes environment / produces poisonous gases when burnt.

II Hydrolysis - Hydrogen
- Oxidation
- Addition

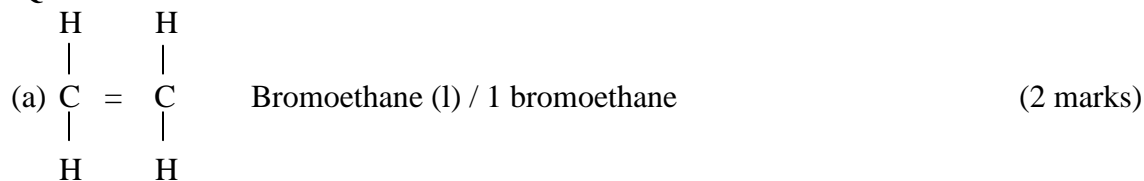
III Ethyl propanoate
 $\text{CH}_3\text{CH}_2\text{COOCH}_2\text{CH}_3$ $\text{C}_5\text{H}_{10}\text{O}_2$

(iv) Calculations of empirical formula mass = 28
 $\frac{16800}{28} = 600$

(c) (i) M or C_3H_6
M is unsaturated / M is an alkene/ carbon dioxide bond

(ii) N is an acidic compound/ alcanoic acid

56. 2009 Q14 P1





57. 2009 Q17 P1

10 electrons (1)

3 single bonds constitutes 6 electrons – There are 5 covalent bonds

Double bond – 4 electrons (1) – 3 single bonds 1 double bond

58. 2009 Q19 P1

(a) Catalyst (1) or words to that effect

(b) Add bromine water or acidified potassium manganate (VII) (1) if they decolorize ($\frac{1}{2}$) then gas is either an alkene or an alkynes ($\frac{1}{2}$)

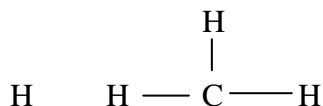
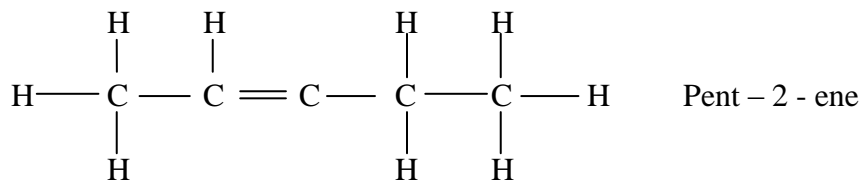
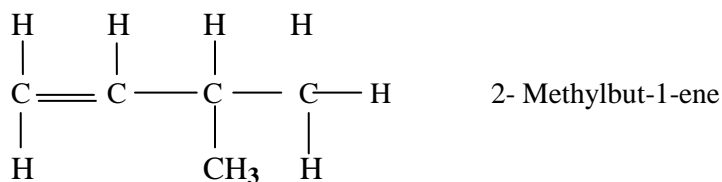
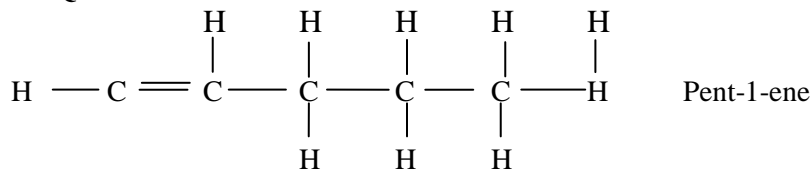
(3 marks)

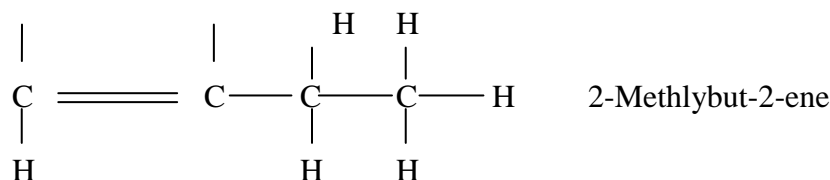
59. 2009 Q24 P1

(a) S_1H_4 it has a higher boiling point (1)

(b) No hydrogen bonding in CH_4 and S_1H_4 (1) while the hydrogen bond in H_2O is stronger than that in H_2S_1 (1)

60. 2010 Q4 P1



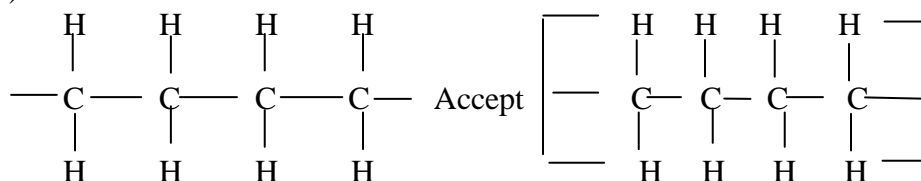


61. 2010 Q2 P2

- a) i) 2,2-dimethylpropane
 ii) Pent-2-yne
- b) Add acidified potassium manganate(VII) or bromine water to each of the compounds in separate test tubes. 2,2-dimethylpropane decolourises while pent-2-yne decolourises them.

- c) i) L – Ethylethanoate
 N – Ethane

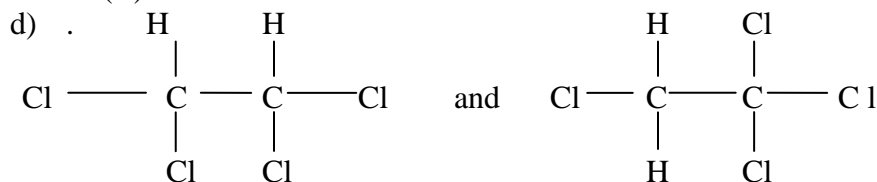
ii)



iii) Reagent = water

iv) (I) Esterification / condensation

(II) Substitution



62. 2011 Q1 P1

(a) Fermentation

- i. Ethanol forms hydrogen bonds with water while ethane does not/ remains molecular / only weak van der Waals forces (intermolecular force).

- Ethane is non-polar while ethanol is polar.

63. 2011 Q6 P2

(i) I Acidified KMnO_4 is decolourised/ changes from purple to colourless.

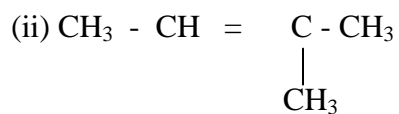
II Add carbonate, effervescence is observed. Or add a mixture of alcohol and conc. H_2SO_4 and warm, a pleasant / smell occurs.

- b. I E polyethene
 II Substance D Sodium ethoxide

(iv) I Step II Dehydration
 II Step (IV) Hydrogenation/ addition reaction

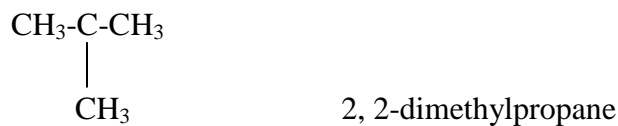
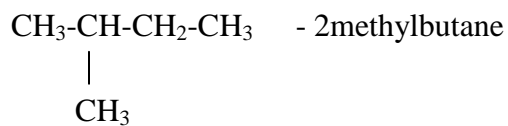
v) **Reagent:** Methanoic acid HCOOH
Conditions: Concentrated sulphuric (VI) acid and warm

(a) (i) Hexan-1-01



64. 2012 Q20 P1

$\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$ - Pentane



65. 2012 Q26 P1

1. Add NaCO_3 to each with ethanoic there is effervescence, no reaction with ethanol
2. add acidified KMnO_4 or $\text{K}_2 \text{Cr}_2\text{O}_7$ from orange to green no change with ethanoic

Acid OR

3. using indicator or litmus papers ,no effect with ethanol, while ethanoic acid affect litmus or indicator (phenolphthalein reject)