

COVENANT UNIVERSITY
NIGERIA

TUTORIAL KIT
OMEGA SEMESTER

PROGRAMME: CHEMISTRY

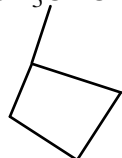
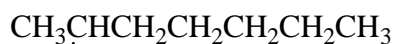
COURSE: CHM 121

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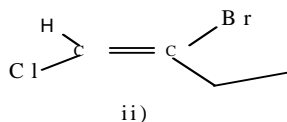
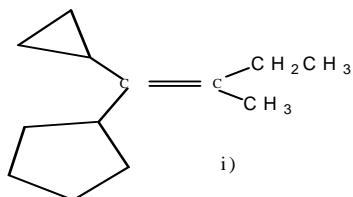
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16. ----- is used to decolourise coloured crystals
 (a) Filter paper (b) Distillation (c) Animal charcoal (d) Sublimation
17. ----- colouration is observed when sodium thiocyanate goes into the sodium extract with ferric ions.
 (a) Sky blue (b) Deep brown (c) Blood red (d) Navy blue
18. The existence of wide range of organic compounds is due to their property of
 (a) Extensive catenation (b) Lower boiling point (c) polymerization (d) Isomerism
19. All except ----- is a spectroscopic technique
 (a) Proton NMR (b) Carbon 13 NMR (c) Paper Chromatography (d) Fourier Transform Infra-red
20. The relative adsorption of components in a mixture is expressed in term of -----
 (a) Retention weight (b) Retention factor (c) Retention mass (d) Mass retention
21. Some of the methods of preparing alkenes are the following, exempt
 (a) dehydration of alcohol (b) reduction of alkynes (c) dehydrohalogenation of alkyl halides
 (d) double dehydrohalogenation of vicinal and geminal halides
22. The IUPAC name for the compound is $\text{CH}_3\text{CH}_2\text{C}(\text{CH}_3)_2(\text{CH}_2)_3\text{CH}_3$
 (a) 1,2-dimethylhexane (b) 2,2-dimethylheptane (c) 3,3-dimethylheptane
 (d) 2,2-dimethylhexane

23. Name the compound



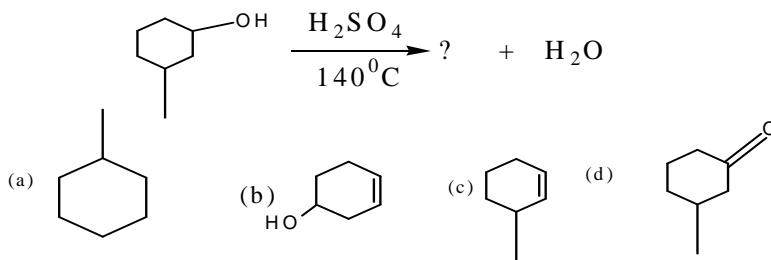
- (a) 5-cyclobutylpentane (b) 2-cycloheptylhexane (c) 2-cyclobutylhexane
 (d) 2-cyclobutylheptane
24. Determine the configuration of the following two compounds as Z or E as appropriate



- (a) E, E respectively (b) Z, E respectively (c) E, Z respectively (d) Z, Z respectively

25. When chlorine and bromine react with alkenes in aqueous solution the product is
 (a) an halogenated amide (b) a vicinal dihalide (c) a geminal dihalide (d) a vicinal halohydrin

26. The complete product for the chemical reaction is



27. Which of the following statements is incorrect?

(a) Ozone reacts rapidly with alkenes to form ozonides. (b) Ozonolysis is used in determining the structure of an alkene. (c) Addition of water and zinc dust to ozonide gives aldehydes and or ketones. (d) Ethane can add on to itself to form an addition polymer.

28. The unsaturated carbon atoms in alkynes are

(a) sp^2 hybridized (b) sp^3 hybridized (c) attached to each other by three bonds
 (d) attached to each other by a and two bonds

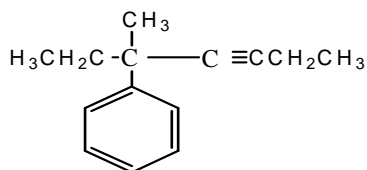
29. Isomerism is the phenomenon in which

(a) same substances have the same molecular formula (b) different substances have the same molecular formula. (c) all compounds have the same properties
 (d) none of the above

30. The isomers of C_4H_8 include the following, except

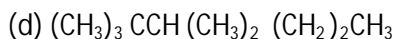
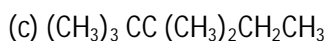
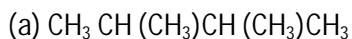
(a) 2-butene (b) 2-methyl propene. (c) cis-2-butene (d) trans-2-butene

31. The IUPAC name for the compound

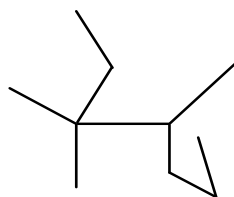
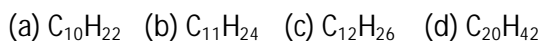


is (a) 5-methyl-3-heptyne-5-benzene (b) 5-methyl-3-phenyl-3-heptyne (c) 5-methyl-5-phenyl-3-heptyne (d) 3-methyl-3-phenyl-4-heptyne

32. The condensed structural formula for 2, 2, 3, 3-tetramethylpentane is



33. The molecular formula for dodecane is



34. The IUPAC name of the above structure is

(a) 2, 3-diethyl-2-methylhexane (b) 4-ethyl-3, 3-dimethyl heptane (c) 4-Ethyl-2, 3-dimethyl heptane (d) 2, 3-diethyl-2-methylheptane

35. The preparation of alkenes include one of the following methods:

(a) - eliminations (b) 1,3- eliminations (c) dehydrohalogenation of alkyl halides

(d) hydration of alcohols

36. The regioselectivity of dehydrohalogenation of alkyl halides follows

(a) Markovnikov's rule (b) Baeyer's rule (c) Zaitsev's rule (d) Syn stereochemistry

37. Hydrogenation of alkynes to alkenes is achieved by using a catalyst called

(a) platinum or nickel (b) aluminium trichloride (c) hydrogen peroxide (d) Lindlar palladium

38. The hydroxylation reaction of ethene gives

(a) ethylene glycol (b) ethane (c) ethanol (d) ethyne

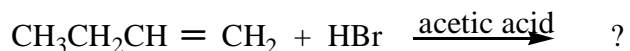
39. When propene is reacted with conc. H_2SO_4 and warmed with dilute HCl, the final product is

(a) propane (b) chloropropane (c) propanol (d) propyne

40. Double dehydrohalogenation of 1,1- dichloro-3,3-dimethyl-butane gives

(a) 1-chloro-3-methyl-1-pentene (b) 2, 3-dimethyl-1-butene (c) 2, 3-dimethyl-1-butyne

- (d) 3, 3-dimethyl-1-butyne
41. The isomerization of n-butane yields
(a) 2-methylbutane (b) 2-methylpropane (c) 3-methylbutane (d) 3-methylpropane
42. Cumulated dienes occur when
(a) the two double bonds are joined by a single bond
(b) a single carbon atom is common to two double bonds
(c) the two double bonds are separated from each other by one or more sp^3 -hybridized C-atoms
(d) two single carbon atoms are common to two double bonds
43. Identify the alkene obtained on dehydration of the alcohol: 3-ethyl-3-pentanol
(a) 2,3-diethyl-3-pentene (b) 2-ethyl-2-pentene (c) 3-ethyl-3-pentene (d) 3-ethyl-2-pentene
44. An alkyl halide reacts with zinc in methanol to give propene and bromine. What is the name of that alkyl halides?
(a) 1,2-dibromopropane (b) 1-bromopropane (c) 2-bromopropane (d) 2, 2-dibromopropane
45. Terminal alkynes are acidic because
(a) the alkynyl carbon is less electronegative
(b) the triple bond is internal
(c) the alkynyl carbon is more electronegative
(d) the molecules are planar
46. How many alkenes have the molecular formula C_6H_{12} ?
(a) 5 (b) 6 (c) 7 (d) none of the above
47. The bond angle in alkenes is (a) 109.8° (b) 120° (c) 180° (d) 360°
48. What is the product formed on the addition of bromine to 4-methyl -2-pentene?
(a) 2,2-dibromo-4-methylpentane (b) 2,3-dibromo-4-methylpentane (c) 2-dibromo-4-methylpentane (d) 3-bromo-4-methylpentene
49. The product of the following addition reaction of an alkene is

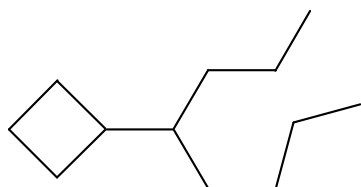


- (a) 1-bromobutane (b) 2-bromobutane (c) 3-bromobutane (d) 1-bromobutene

50. Stereoisomers are compounds that

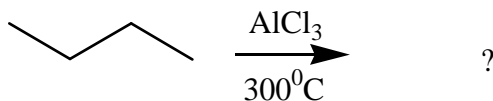
- (a) have different sequences of atoms
 (b) have the same atom's spatial orientation. (c) have the same order of connectivity.
 (d) none of the above

51. Name the compound b:



- (a) 4-cyclobutylhexane (b) 3-hexylcyclobutane
 (c) 4-cyclobutyloctane (d) 4-octanylcyclobutane

52. Complete this reaction



- (a) (b) (c) (d)

53. Sodium alkanoate reacts with sodium hydroxide to afford alkanes. If the desired product is domestic cooking gas (butane), what will be the alkanoate starting material?

- (a) $\text{CH}_3(\text{CH}_2)_2\text{COONa}$ (b) $\text{CH}_3\text{CH}_2\text{COONa}$ (c) $\text{CH}_3(\text{CH}_2)_3\text{COONa}$ (d) $\text{CH}_3(\text{CH}_2)_4\text{COONa}$

54. When KMnO_4 reacts with an alkene it turns

- colourless (b) yellow (c) purple (d) pink

55. The controlled hydrogenation of alkynes in the presence of sodium in liquid ammonia gives

- (a) alkanes (b) alkenes (c) aromatics (d) mixtures alkanes and alkenes

56. A compound Z with molecular formula $C_5H_{12}O$ gave steamy white fumes in PCl_5 . Upon treatment of Z with Lucas reagent, two layers separated out immediately. Which of the following compounds is the most probable name of compound Z

(a) 2-methylbutan-2-ol (b) 3-methylbutan-2-ol (c) 2,3-dimethylpropan-1-ol (d) ethoxy propane

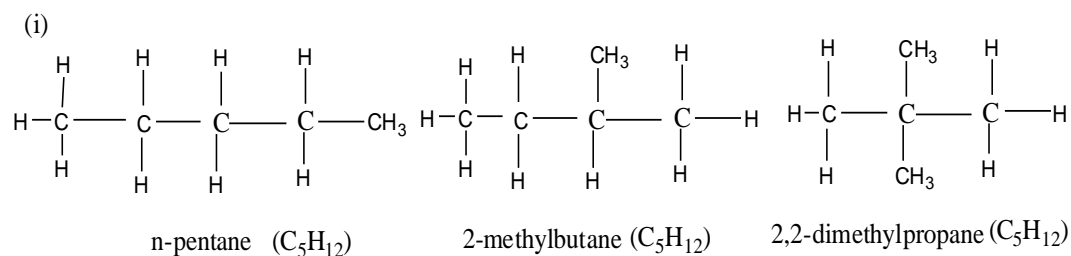
57. Which of the following isomerisms will not occur within the same homologous series

(a) positional (b) chain (c) functional group (d) optical

58. The product of oxidation of butan-1-ol in the presence of excess $KMnO_4 / H^+$ is

(a) butanal (b) butanone (c) butanoic acid (d) potassium butanoate

59. Identify the type of isomerism which occurs in the compounds shown below:



(a) geometrical (b) positional (c) chain (d) optical

60. Acetylene undergoes addition reaction with bromine to give a product of?

(a) 1,2,1,2-tetrabromoethane (b) 1,2-dibromoethane (c) 1,1,2,2-tetrabromoethane (d) 1,2-dibromoethene

61. Markovnikov rule obeys addition reactions with alkyne (a) symmetrical (b) similar (c) parallel (d) unsymmetrical

62. Carboxylic acid reacts with alcohol under acid catalysis to produce

(a) ether (b) ester (c) mineral acid (d) coke

63. The molecular formula for 2-pentyne is (a) $CH_3CH_2C\equiv CCH_3$ (b) $CH_3CH_2C\equiv CH$ (c) $CH_3CH_2CH_2CH\equiv CH$ (d) $CH_3C\equiv CCH_3$

64. Secondary amine will react with acid halides to produce (a) 1° amide (b) 2° amide (c) 3° amide (d) 3° amine

65. The molecular formula for 2-methyl-1-propanol (isobutyl alcohol) is

- (a) $(\text{CH}_3)\text{CHCH}_2\text{OH}$ (b) $(\text{CH}_3)_2\text{CH}_2\text{OH}$ (c) $\text{CH}_3\text{CH}_2(\text{OH})\text{CH}_3$ (d) $(\text{CH}_3)_2\text{CHCH}_2\text{OH}$
66. The IUPAC name of $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$ is (a) ethoxyethyne (b) ethoxyethane (c) ethoxypropane (d) methoxyethane
67. The IUPAC name of $\text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_3$ is (a) 3-pentanone (b) 2-pentanone (c) 2-butanone (d) pentanone
68. The order of reactivity of alkyl halides formed from alcohol reaction with halogens is (a) alkyl iodide > alkyl bromide > alkyl chloride (b) alkyl iodide < alkyl bromide < alkyl chloride (c) alkyl chloride > alkyl iodide > alkyl bromide (d) alkyl iodide < alkyl chloride < alkyl bromide
69. Primary alcohol is oxidized into (a) aldehyde (b) ketone (c) carboxylic acid (d) unaffected
70. The bond angle for carbonyl is (a) 150° (b) 120° (c) 110° (d) 210°

SOLUTION

- | | | | |
|-----|----------|-----|----------|
| 1. | B | 36. | Ans xxxx |
| 2. | Ans xxxx | 37. | D |
| 3. | B | 38. | Ans xxxx |
| 4. | Ans xxxx | 39. | C |
| 5. | D | 40. | Ans xxxx |
| 6. | Ans xxxx | 41. | B |
| 7. | C | 42. | Ans xxxx |
| 8. | Ans xxxx | 43. | D |
| 9. | A | 44. | Ans xxxx |
| 10. | Ans xxxx | 45. | D |
| 11. | C | 46. | Ans xxxx |
| 12. | Ans xxxx | 47. | B |
| 13. | D | 48. | Ans xxxx |
| 14. | Ans xxxx | 49. | B |
| 15. | B | 50. | Ans xxxx |
| 16. | Ans xxxx | 51. | C |
| 17. | C | 52. | Ans xxxx |
| 18. | Ans xxxx | 53. | C |
| 19. | C | 54. | Ans xxxx |
| 20. | Ans xxxx | 55. | B |
| 21. | D | 56. | Ans xxxx |
| 22. | Ans xxxx | 57. | C |
| 23. | D | 58. | Ans xxxx |
| 24. | Ans xxxx | 59. | C |

- 25. B
- 26. Ans xxxx
- 27. B
- 28. Ans xxxx
- 29. D
- 30. Ans xxxx
- 31. C
- 32. Ans xxxx
- 33. C
- 34. Ans xxxx
- 35. C

- 60. Ans xxxx
- 61. D
- 62. Ans xxxx
- 63. A
- 64. Ans xxxx
- 65. D
- 66. Ans xxxx
- 67. A
- 68. Ans xxxx
- 69. A
- 70. Ans xxxx