COVENANT UNIVERSITY NIGERIA

TUTORIAL KIT OMEGA SEMESTER

PROGRAMME: CHEMISTRY

COURSE: CHM 121

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1. What type of paper chromatographic method has its mobile phase moves horizontally round a sheet of paper (a) Ascending paper chromatography (b) Radial paper chromatography (c) Descending paper chromatography (d) Oscillating paper chromatography 2. In paper chromatography ------ is the stationary phase (a) Solid (b) Gas (c) Liquid (d) Vapour In column chromatography, component that are less adsorbed are retained at the top while 3. others that are strongly adsorbed move further downward the column. (a) True (b) False (c) Sometimes (d) True and Sometimes Chromatographic technique was introduced by a Russian scientist known as -------4. (a) T.S. Tswett (b) M.S. Tswett (c) T.S. Chroma (d) Faraday ----- metal is used in the Lassaigne's test for the detection of Nitrogen, Sulphur, and the 5. halogen (a) K+ (b) Mg (d) Na (c) K The appearance of ------ as a precipitate during the detection of Nitrogen confirms its 6. presence (a) Prussian blue or green colouration (b) Black-green colouration (c) Green-yellow colouration (d) Prussian blue and green colouration ------ drying agent is best used for oxygen and nitrogen containing compounds 7. (a) MgSO₄ (b) K_2SO_4 (c) K_2CO_3 (d) $MqCO_3$ An impure compound must satisfy the following conditions during steam distillation except 8. a. It should not decompose at the steam temperature (b) It should have a fairly high vapour present at 373K (c) It should be insoluble in water (d) The impurities present should be volatile 9. Calculate the distance moved by a substance A when the distance moved by the mobile phase is 5.40 cm and the retention factor is 0.7256 (a) 3.91 cm (b) 7.44 cm (c) 12.07 cm (d) 3.50 cm 10. The following are common drying agent for organic solutions but which of them has high capacity, fast speed, and good efficiency as its chemical property. (b) CaCl₂ (a) CaSO₄ (c) K_2CO_3 (d) MaSO₄ All except ------is not employed as an adsorbents in column chromatography 11. (a) Starch (b) Silica gel (c) Silica alumina (d) MqO An organic compound was shown on a quantitative analysis to contain 32.0% carbon, 16.7% 12. hydrogen, and 51.3% oxygen. Determine the empirical formula of the compound. (c) $C_3H_5O_2$ (b) CH_6O (a) C_3H_6O $(d) C_6 H_5 O$ If the molecular mass of the compound in question 12 is 68, find its molecular formula 13. $C_6 H_{10} O_4$ (b) $C_{12}H_{10}O_2$ (c) $C_6H_{12}O_2$ (d) $C_2 H_{12} O_2$ (a) ----- is a qualitative feature of organic compounds when considering its physical property 14. (a) Refractive index (b) boiling point (c) consistency (d) melting point In qualitative detection of carbon and hydrogen ----- is used to confirm water 15. (a) Lime water (b) Anhydrous copper sulphate (c) Hydrated copper sulphate (d) Lead sulphate

- 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 ferricions.
 - (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 Infrared
- 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 germinal halides
- 22. The IUPAC name for the compound is CH₃CH₂C(CH₃)₂(CH₂)₃CH₃
 - (a) 1,2-dimethylhexane (b) 2,2-dimethyheptane (c) 3,3-dimethylheptane
 - (d) 2,2-dimethylhexane
- 23. Name the compound

CH₃CHCH₂CH₂CH₂CH₂CH₂CH₃



- (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 germinal 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 alkyne. (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) sp² hybrized (b) sp³ hybrized (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
 - (a) $CH_3 CH (CH_3)CH (CH_3)CH_3$
 - (b) $(CH_3)_2 CH C(CH_3)_2 CH_3$
 - (c) $(CH_3)_3 CC (CH_3)_2 CH_2 CH_3$
 - (d) $(CH_3)_3 CCH (CH_3)_2 (CH_2)_2 CH_3$
- 33. The molecular formula for dodecane is

(a) $C_{10}H_{22}$ (b) $C_{11}H_{24}$ (c) $C_{12}H_{26}$ (d) $C_{20}H_{42}$



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'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 HCI, 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 sp³-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

 $CH_3CH_2CH = CH_2 + HBr$ <u>acetic acid</u> ?

- (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



- 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) CH₃(CH)₂COONa (b) CH₃CH₂COONa (c) CH₃(CH₂)₃COONa (d)CH₃(CH₂)₄COONa
- 54. When KMnO₄ 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 PCI₅. 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

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(a) butanal (b) butanone (c) butanoic acid (d) potassium butanoate
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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 formular for 2-pentyne is (a) CH₃CH₂C=CCH₃ (b) CH₃CH₂C=CH (c) CH₃CH₂CH₂CH=CH (d) CH₃C=CCH₃
- 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 formular for 2-methyl-1-propanol (isobutyl alcohol) is

(a) $(CH_3)CHCH_2OH$ (b) $(CH_3)_2CH_2OH$ (c) $CH_3CH_2(OH)CH_3$ (d) $(CH_3)_2CHCH_2OH$

- 66. The IUPAC name of CH₃CH₂OCH₂CH₃ is (a) ethyoxyethyne (b) ethoxyethane (c) ethoxypropane (d)methoxyethane
- 67. The IUPAC name of CH₃CH₂COCH₂CH₃ 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.	В	36.	Ans xxxx
2.	Ans xxxx	37.	D
3.	В	38.	Ans xxxx
4.	Ans xxxx	39.	С
5.	D	40.	Ans xxxx
6.	Ans xxxx	41.	В
7.	С	42.	Ans xxxx
8.	Ans xxxx	43.	D
9.	A	44.	Ans xxxx
10.	Ans xxxx	45.	D
11.	С	46.	Ans xxxx
12.	Ans xxxx	47.	В
13.	D	48.	Ans xxxx
14.	Ans xxxx	49.	В
15.	В	50.	Ans xxxx
16.	Ans xxxx	51.	С
17.	С	52.	Ans xxxx
18.	Ans xxxx	53.	С
19.	С	54.	Ans xxxx
20.	Ans xxxx	55.	В
21	D	56.	Ans xxxx
22.	Ans xxxx	57.	С
23.	D	58.	Ans xxxx
24.	Ans xxxx	59.	С

25.	В	60.	Ans xxxx
26.	Ans xxxx	61.	D
27.	В	62.	Ans xxxx
28.	Ans xxxx	63.	А
29.	D	64.	Ans xxxx
30.	Ans xxxx	65.	D
31.	С	66.	Ans xxxx
32.	Ans xxxx	67.	А
33.	C	68.	Ans xxxx
34.	Ans xxxx	69.	А
35.	C	70.	Ans xxxx