CHM 102 Answers to 2017/18 test

by
OLUMII
08138115993

(1) sp^3d^2 — A

(2) Valence-Shell electron pair repulsion — A

(3) Boron trifluoride — A

(4) 5, 5-dichloro-4-methyl-2-pentyne — D

(5) Arenes — C

(6) 2, 4, 5-trimethylheptane — D

(7) phenoxide — D

(8) Raschig-Hooker process — C

(9) t-butylbenzene — B

(10) Electrophile — B

(11) Initial Step — A

(12) Rare — B

(13) All of these — D

(14) Rotates the plane of plane-polarized light — B

(15) Chiral — A

Answers to 2018/2019 CHM 102 ~~Test~~ Examination

by

OLUMII
08138115993

① If the molecular mass of Z was found to be 179 and the emprical formula CH_2O. What is the molecular formular of the Z?

Ans ⇒ ~~$C_6H_{12}O_6$~~ $C_6H_{12}O_6$ → C

Workings

Emperical formula	molar mass	Emperical molar mass	whole number	molecular ~~formular~~ mass
CH_2O	179	12+1×2+16 = 30	179/30 = 5.9 ≈ 6	$(CH_2O)\times 6$ = $C_6H_{12}O_6$

② A compound P on analysis was found to contain 19.7% carbon, 2.5% hydrogen, and 11.5% nitrogen. What is the emporical formula? (Atomic mass C=12, H=1.01, O=16, N=14)

Ans ⇒ $C_2H_3NO_5$ → A

Workings

Element	%	mm	Relative mm	Simple ratio	Simple ratio in whole (:)
C	19.7	12	19.7/12 = 1.6	1.6/0.8 = 2	2
H	2.5	1	2.5/1 = 2.5	2.5/0.8 = 3.1	3
N	11.5	14	11.5/14 = 0.8	0.8/0.8 = 1	1
O	66.3	16	66.3/16 = 4.1	4.1/0.8 = 5	5
					$C_2H_3NO_5$

(3) Boron trifloaride ⟶ A

(4) Acid chloride ⟶ A

(5) Hybridigation for trigonalbypgramid
Ans ⟹ sp^3d ⟶ A

(6) Organic chemistry is the study of ____ and its compounds
Ans ⟹ Carbon ⟶ A

(7) ____ are not hydrocarbon
Ans ⟹ Alcohols ⟶ D

(8) Carbon present in organic compund is oxidized to ____ which turns lime water milky.
Ans ⟹ CO_2 ⟶ C

(9) In the determination of hydrogen, water turns white anhydrous $CuSO_4$ ____
Ans ⟹ blue ⟶ B

(10) Lassaigne's test is also known as ____ test.
Ans ⟹ Sodium fusion ⟶ C

(11) Cyclohexane ⟶ B

(12) Alkanes burns with ____
Ans ⟹ light smoky flame ⟶ B

(13) Complete substitution reaction of H with Cl in methanes ____
Ans ⟹ Tetrachloromethane ⟶ A

(14) Para Dichlorobengene is the same as ____
Ans ⟹ 1, 4 - dichlorobengene. ⟶ C

(15) One of the distinguishing features of Alkynes is ____
Ans ⇒ It has triple bond → B

(16) The hydrolysis of Chlorobenzene using Steam to produce phenol is called ____
Ans ⇒ Raschig - Hooker Process → C

(17) All the following alkyl benzenes undergo oxidation to acids with Strong oxidizing agents except ____ benzene
Ans ⇒ t-butyl → B

(18) All the following are examples of secondary amines except ____
Ans ⇒ Triphenylamine → D

(19) A carbon atom in a ring can be a chirality center if it bears ____ different substituent
Ans ⇒ two → C

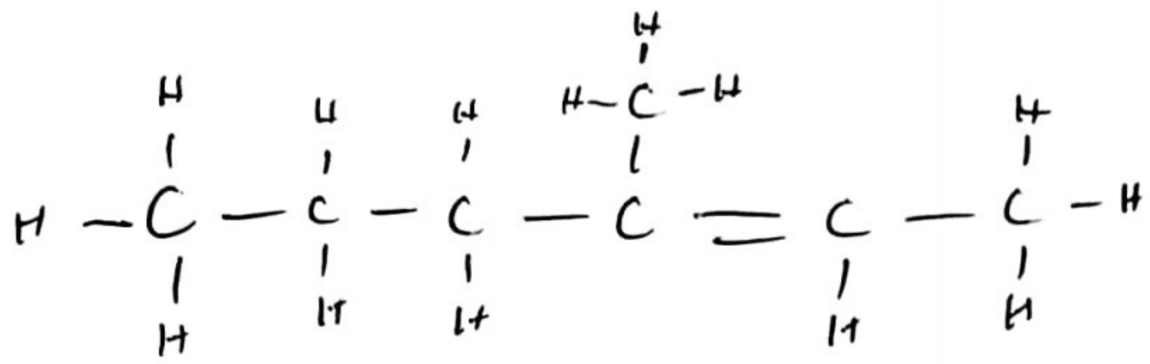
(20) All the following are reactions of ketones except ____
Ans ⇒ Decarboxylation → D

OLUMII

Answers to 2016/2017 CHM 102 Exam

by
OLUMII
08138115993

(1) IUPAC name for $CH_3(CH_2)_2C(CH_3)=CHCH_3$ is



Ans ⟹ 3-methyl-2-hexene //

(2) 1, 4-dichlorobenzene is the same as _____

Same as

1, 4-dichlorobenzene

Ans ⟹ p-chlorobenzene //

(3) Alkanes burns with _____

Ans ⟹ Light smoky flame

(4) Alkynes undergo addition reaction while alkanes undergo _____

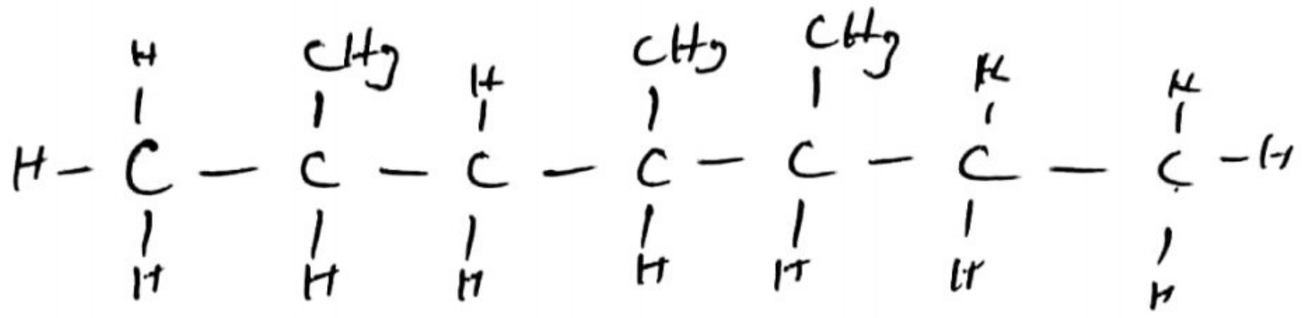
Ans ⟹ Substitution reaction

(5) Alkanes with 5-7 carbon atoms are _____

Ans ⟹ Volatile liquids

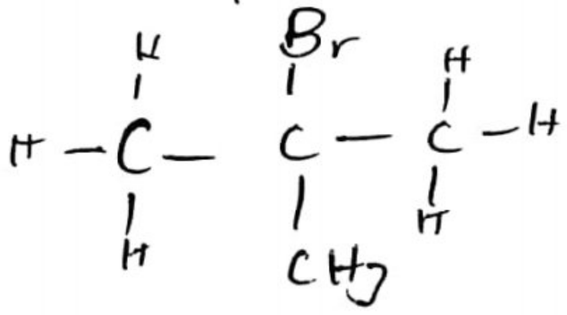
Olumii

(6) IUPAC name of $CH_3CH(CH_3)CH_2CH(CH_3)CH(CH_3)CH_2CH_3$



Ans ⟹ 2, 4, 5 - trimethylheptane

(7) IUPAC name of $CH_3C(Br)(CH_3)CH_3$ is _____



Ans ⟹ 2-bromo-2-methylpropane

(8) A carbon atom in a ring can be a chirality centre if it bears _____ different substituents

Ans ⟹ two

(9) 2-butanol is the compound with a stereogenic center.

Ans ⟹ 2-butanol

(10) Isomers having different bond connectivities are called _____

Ans ⟹ Constitutional

(11) _____ substance is non-superimpossible on its mirror image.

Ans ⟹ Chiral

(12) Factor that is most important in determining the chemistry of an organic molecule.

Ans ⟹ The functional group

(13) A tetrahedral carbon atom that bears _____ different atoms or group be called a asymmetric center.

Ans ⟹ four

(14) Aldohexose and ~~ketose~~ ketopentose are 6 and 5 carbon monosaccharides containing an aldehyde and ketone groups.

Ans ⟹ 6 and 5

(15) Rate determining step containing single specie (atom or molecule) ~~to~~ will make reaction _____

Ans ⟹ Unimolecular

(16) Dehydration of an alcohol lead to the formation of an _____

Ans ⟹ alkenes

(17) Ethanol can be oxidized stepwise. What is the first stable intermediate product when ethanol is oxidized

with mild oxidation agent?

$$C_2H_5OH + O_2 \xrightarrow[Dil.\ H_2SO_4]{} R\text{-}CHO \longrightarrow CH_3CHO$$

Ans ⇒ CH_3CHO

(18) Which of the following alcohols form ketone when oxidized

Ans ⇒ 2-propanol

(19) The organic starting materials for the preparation of an ester could be _____

Ans ⇒ an acid and an alcohol

(20) Hydrolysis (saponification) of a fat would yield _____

Ans ⇒ glycerol and soap (glycerol & 3 fatty acids)

(21) Which of the following is an electrophile _____

Ans ⇒ BF_3 (because it has an empty 2p orbital that possesses partial ~~charge~~ positive charge)

(22) Cyclohexanone are produced by _____

Ans ⇒ Aerobic oxidation of cyclohexane

(23) Carboxylic acids are Bronsted–Lowry acids because they are _____

Ans ⇒ PN ton donor

(24) What accounts for the aromacity in benzene

Ans ⇒ Conjugated double bond

(25) Friedel craft acylation of benzene requires treating benzene with a mixture of ____

Ans ⇒ ethanoyl chloride and ~~aaaa~~ aluminium chloride

(26) The polarity and solubility of alcohols is due to the presence of ____

Ans ⇒ Hydroxyl group

(27) The reaction of phenol with diazomethane in the presence of bromine triflonde yields ____

Ans ⇒ Anisole

(28) Shaken a mixture of phenol and benzoyl chloride in the presence of dilute ~~Sat~~ sodium hydroxide solution to produce phenyl benzoate is an example of ____

Ans ⇒ The Schotten – Baumann reaction

(29) The bond angle of sp^2 hybrid orbital is ____

Ans ⇒ 120°

(30) The molecular orbital of lower energy is called

Ans ⇒ bonding orbital

(31) Organic compounds can be classified into ____

Ans ⇒ two (Structure & functional group

(2) The general formula for alkene is

Ans ⟹ C_nH_{2n}

(33) The percentage ~~of~~ composition of fruit sugar was found to be carbon 40%, hydrogen 6.6%. Calculate its empirical formula.

Ans ⟹ CH_2O

OLUMII

Workings

Element

C = 40% H = 6.6% ~~Mass~~ That is we have 53.4% O

Element	Percentage	molar mass	Relative molar mass	Simplest ratio	Simplest ratio in whole
C	40	12	$40/12 = 3.3$	$3.3/3.3 = 1$	1
H	6.6	1	$6.6/1 = 6.6$	$6.6/3.3 = 2$	2
O	53.4	16	$53.4/16 = 3.3$	$3.3/3.3 = 1$	1

1 — Carbon

2 — Hydrogen ⟹ CH_2O

1 — Oxygen

(34) Adenine an important biochemical has a molar mass of 135.1 and consists of 44.45% C, 3.73% H and 52.82% N by mass, what is the molecular formula?

Ans ⟹

NOTE ⟹ The question is NOT Correct

~~Workings~~

C	H	N
44.45%	3.73%	52.82%

Total = 101%

It is greater than 100% so the question is NOT correct

(35) The usual way to identify Sulphur, Nitrogen and Halogens in organic substance is _____

Ans ⟹ Lassaigne's test

(36) Which of the following is not a product during the process of identifying Sulphur, Nitrogen and Halogen in an organic compound?

Ans ⟹ NaCCl

Answers to CHM 102 Exam Question 2017/2018 Session

by OLUMIDE

(1) The optical rotation depends upon the ---.

Ans ⇒ All of these

(2) An optically active molecule ---.

Ans ⇒ rotates the plane of plane-polarised light.

(3) A solution containing equal quantities of enatiomers is called ----

Ans ⇒ racemic mixture

(4) Which one of the following organic compound has a stereogenic center?

Ans ⇒ Bromochlorofluoromethane

(5) Which factor is most important in determining the chemistry of an organic molecule?

Ans ⇒ The functional group

(6) A tetrahedral carbon atom that bears --- different atoms or groups be called a asymmetric center.

Ans ⇒ four

(7) All achiral substances are --- different atoms or groups be called a asymmetric center

Ans ⇒ optically inactive

(8) Aldehydes oxidize faster than ketones because of

Ans ⇒ Presence of the hydrogen atom attached to its carbonyl group.

(9) Methyl vinyl ketone ($CH_3C(O)CHCH_2$) is an example of a
Ans ⇒ Unsaturated ketone

(10) When a carboxylic group is deprotonated, its conjugate base is called.—
Ans ⇒ Carboxylate anion

(11) The process of preparing amines by reacting ammonia with alcohol is called
Ans ⇒ Alkylation

(12) All of the following are reactions of ketones except
Ans ⇒ Decarboxylation

(13) The process by which benzene is produced from heptane is called _ ———
Ans ⇒ Catalytic reforming

(14) The difference between a primary and secondary alcohol is in
Ans ⇒ The number of alkyl group attached to the carbon carrying the OH

(15) Alkylation is defined as
Ans ⇒ the process of combining small molecule to form bigger molecule.

(16) Members of alkane group with carbon 1–4 are --
Ans ⇒ gases

(17) formation of tetrachloro methane occur as a results of ---
reaction of alkanes
Ans ⇒ Substitution reaction

1,3-dichlorobenzene is the same as one of the followings

Ans ⇒ M-chlorobenzene

(19) The arenes are ___

Ans ⇒ Aromatic compounds

(20) Quality of gasolene is measured by the octane number and improved by ___

Ans ⇒ Increasing the number of branched chain, unsaturation and ring compounds

(21) Alkynes burns with ___

Ans ⇒ Smoky flame

(22) What is colour of precipitated formed when lead acetate solution is added to a solution containing sulphur?

Ans ⇒ Black precipitate

(23) When nitric acid and silver nitrate is added to a compound X, a yellow precipitate which was soluble in excess ammonia - Which of the element is present in the compound X

Ans ⇒ I Iodide

(24) Which of the method is used for quantitative determination of halogen?

Ans ⇒ Carius's method

(25) If the molecular mass of fruit sugar was found to be 180.2 and the empirical formula CH_2O. What is the molecular formula of the fruit sugar?

Ans ⟹ $C_6H_{12}O_6$ → C

Workings

Emperical formula	molar mass	Emperical molar mass	whole number	molecular mass of formula
CH_2O	180.2	12+1×2+16 = 30	180.2/30 = 6.0	$(CH_2O)\times 6$ = $C_6H_{12}O_6$

(26) A compound Y on analysis was found to contain 19.8% carbon, 2.5% hydrogen, and 11.6% Nitrogen. What is the empirical formula. (Atomic mass C = 12, H = 1.01, O = 16, N = 14)

Ans ⟹ $C_2H_3NO_5$

Workings

Element	%	mm	Relative mm	Simple ratio	Simple ratio in whole
C	19.8	12	19.8/12 = 1.65	1.65/0.83 = 1.98	2
H	2.5	1	2.5/1 = 2.5	2.5/0.83 = 3.01	3
N	11.6	14	11.6/14 = 0.83	0.83/0.83 = 1	1
O	66.1	16	66.1/16 = 4.1	4.1/0.83 = 4.9	5
					$C_2H_3NO_5$

(27) Which of the following is not example of aromatic compound?

Ans ⟹ Cyclohexane

(28) The formula $C_nH_{2n+1}CONH_2$ stands for the following compound.

Ans ⟹ primary amide

(29) Rate determining step containg single specie (atom, ion or molecule) will make reaction __

Ans ⇒ Unimolecular

(30) Dehydration of an alcohol lead to the formation of an —

Ans ⇒ Alkenes

(31) Ethanol can be oxidized stepwise. What is the first stable intermediate product when ethanol is oxidized with mild oxidation agent?

Ans ⇒ CH_3CHO

(32) Which of the following alcohols form ketone when oxidized?

Ans ⇒ 2-propanol

(33) The organic starting materials for the preparation of an ester could be __

Ans ⇒ an acid and an alcohol

(34) The hybridization of the central carbon in $CH_3C{\equiv}N$ and the bond angle CCN are ___

Ans ⇒ SP

(35) Which of the following statements about an SP hybridized carbon is FALSE?

Ans ⇒ It has two p orbitals