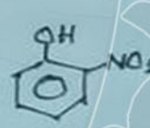
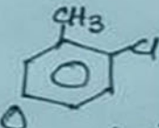
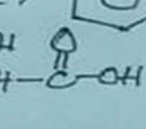
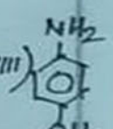
SCIENCE

Subject : Chemistry

Date : 10/04/2020

Organic Chemistry (HSI).

1. How can you detect the presence of Nitrogen in an organic compound by Lassaigne's test. Give the equations of the reactions involved.
2. Ammonia obtained from 0.4g of an organic compound by Kjeldahl's method is absorbed in 50ml of 0.25M H_2SO_4. The excess acid is neutralised by 30ml of 0.2M NaOH solution. Calculate the % of nitrogen in the organic compound.
3. What type of isomerism is exhibited by following pairs?
(i) $CH_3-\underset{CH_3}{CH}-\overset{O}{\overset{\|}{C}}-H$ & $CH_3-\overset{O}{\overset{\|}{C}}-CH_2-CH_3$ (ii) $CH_3-\overset{O}{\overset{\|}{C}}-CH_2-CH_2-CH_3$ & $CH_3-\overset{O}{\overset{\|}{C}}-\underset{CH_3}{CH}-CH_3$
(iii) $CH_3-\underset{CH_3}{CH}-\underset{OH}{CH}-CH_3$ & $CH_3-\underset{CH_3}{\overset{OH}{C}}-CH_2-CH_3$ (iv) $CH_3-CH_2-O-CH_2-CH_3$ & $CH_3-O-\underset{CH_3}{CH}-CH_3$
4. Why alkenes show geometrical isomerism. Draw the configurations of geometrical isomers of 2-Bromo-3-chlorobut-2-ene and designate these by using cis-trans nomenclature.
5. Of the different conformers of ethane, which one is least stable and which one is most stable. Draw the conformers.
6. What is inductive effect? Arrange the different alkyl groups in the increasing order of their positive inductive effect.
7. Draw the different resonating forms of aniline. Why $-NH_2$ gr. in aniline is o,p-directing in nature during electrophilic substitution.
8. What is carbanion? Arrange the alkyl carbanions in the increasing order of their stabilities. What is the state of hybridisation of negatively charged carbon in alkyl carbanion? What is the arrangement of bonds around it?
9. What are electrophiles and nucleophiles? Classify the following as electrophile and nucleophile.
$\ddot{C}H_3$, $CH_3\ddot{O}H$, Br^+, $\ddot{C}N$, $(CH_3)_3\overset{+}{C}$
10. State Huckel rule of $(4n+2)\pi$ electrons? Why benzene is aromatic but cyclooctatetrene is not?
11. Give the IUPAC name of the following:
(i) $CH_3-\underset{CH_3}{C}=CH-\overset{O}{\overset{\|}{C}}-H$ (ii) $CH_3-\underset{CH_3}{CH}-\overset{O}{\overset{\|}{C}}-OC_2H_5$ (iii)  (iv) 
(v) $CH_3-\underset{CH_3}{CH}-\overset{O}{\overset{\|}{C}}-NH_2$ (vi) $CH_3-\underset{CH_3}{CH}-CH_2-\underset{C_2H_5}{CH}-CH_2-CH_3$ (vii)  (viii) 
12. What happens when
a) 2-Bromobutane is treated with alc KOH b) Sod-2-methyl propanoate is heated with soda-lime. c) 2,3-Dichloropentane is treated with alc KOH and sodamide d) Hexane is heated with Cr_2O_3 and Al_2O_3 e) Ethanoic acid is treated with conc HI and red P. f) 2,3-Dibromopentane is heated with Zn. g) Propyne is passed through dil H_2SO_4 in presence of $HgSO_4$. h) Phenol is heated with Zn-dust. i) Conc aq solution of sodium succinate is electrolysed. j) 2-Methyl but-2-ene is ozonolysed. k) Propene is treated with HBr in presence of peroxide. l) 2-Methyl but-2-ene is treated with hot concentrated aq solution of $KMnO_4$. m) Benzene is treated with conc HNO_3 in presence of conc H_2SO_4. n) 2-chloropropane is treated with Na in presence of dry ether. o) Butan-2-ol is heated with conc H_2SO_4.

13. How can you convert:
a) Propylene to propylene glycol b) Propene to Propan-2-ol c). Chloro benzene to benzene d). Methyl magnesium iodide to methane. e) Ethyne to benzene f) Benzene to toluene g). Propan-2-ol to propane h) Toluene to benzoic acid i). Sodium benzoate to benzene j) Ethyne to But-2-yne k) Toluene to benzaldehyde e) Propyne to propene m). Benzene to chlorobenzene n) 2,2-Dichloro. butane to But-2-yne o). Bromoethane to ethane.

14. why terminal alkynes are acidic in nature. Give one chemical test to distinguish betⁿ But-1-yne and But-2-yne.

15. How can you detect the presence of unsaturation in an organic compound? Give reaction.

16. what are heterocyclic compounds? Give example of an aromatic heterocyclic compound.

17. Give the mechanism of electrophilic substitution reaction of benzene by considering the friedel Craft's alkylation of benzene.

18. Give the mechanism of electrophilic addition reaction of alkene by considering the hydration of propene.

19. Give the mechanism of free-radical substitution reaction of alkane by considering the chlorination of methane in presence of excess Cl_2 & light. what happens when propane is treated with insufficient Cl_2 in presence of light?

[for any doubt, contact on 9435178587]