ORGANIC CHEMISTRY II (ALKANOIC ACIDS AND ALKANOLS)

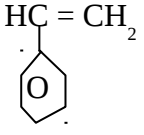
1. A student mixed equal volumes of Ethanol and butanoic acid. He added a few drops of
concentrated Sulphuric (VI) acid and warmed the mixture
(i) Name and write the formula of the main products

Name.....

Formula.....

(ii) Which homologous series does the product named in (i) above belong?

2. The structure of the monomer phenyl ethene is given below:-



(i) Give the structure of the polymer formed when four of the monomers are added together

(ii) Give the name of the polymer formed in **(a)** above

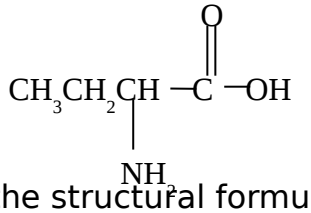
3. Explain the environmental effects of burning plastics in air as a disposal method

4. Write chemical equation to represent the effect of heat on ammonium carbonate

5. Sodium octadecanoate has a chemical formula $CH_3(CH_2)_6\ COO^-Na^+$, which is used as soap.

Explain why a lot of soap is needed when washing with hard water

6. A natural polymer is made up of the monomer:

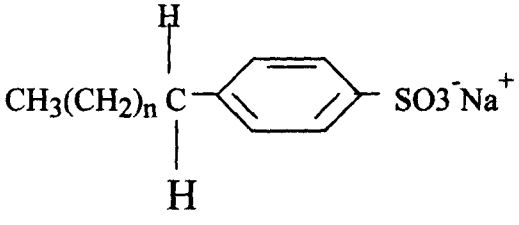


a) Write the structural formula of the repeat unit of the polymer

(b) When 5.0×10^{-5} moles of the polymer were hydrolysed, 0.515g of the monomer were obtained.

Determine the number of the monomer molecules in this polymer.
(C = 12; H = 1; N = 14; O =16)

7. The formula below represents active ingredients of two cleansing agents **A** and **B**



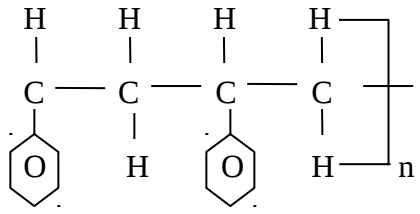
Agent A

$CH_3(CH_2)_6\ COO^-Na^+$

Agent B

Which one of the cleansing agents would be suitable to be used in water containing magnesium hydrogen carbonate? Explain

8. Study the polymer below and use it to answer the questions that follow:



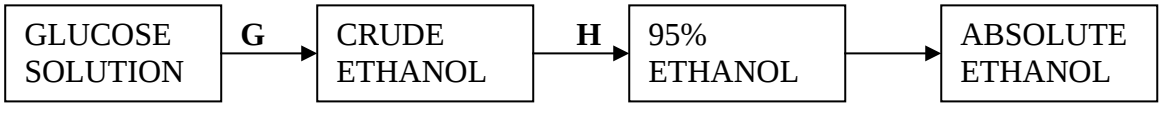
a) Give the name of the monomer and draw its structures

b) Identify the type of polymerization that takes place

c) State **one** advantage of synthetic polymers

9. Ethanol and Pentane are miscible liquids. Explain how water can be used to separate a mixture
of ethanol and pentane

10.



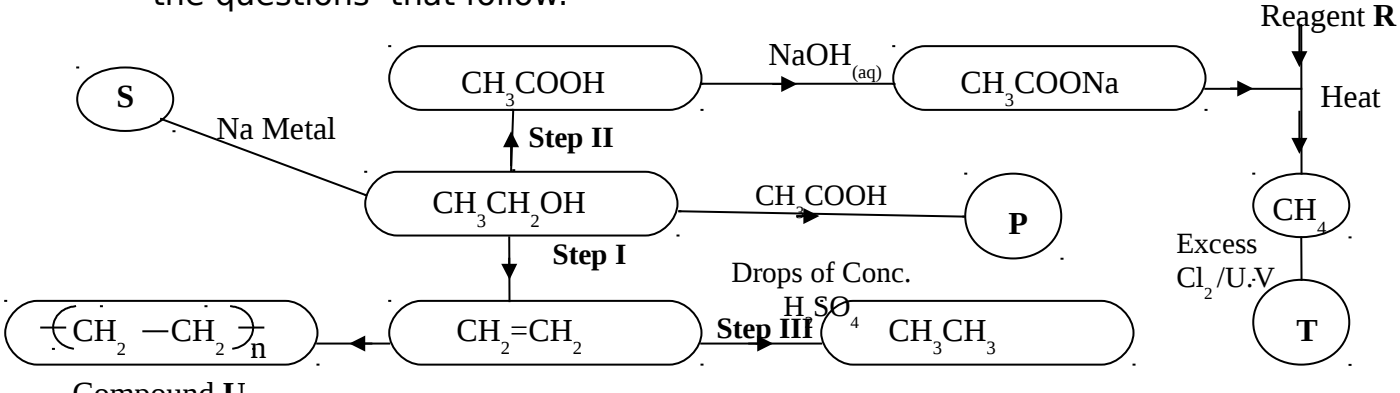
(i) What is absolute ethanol?

(ii) State **two** conditions required for process **G** to take place efficiently

11. (a) Give the IUPAC names of the following compounds:
(i) $CH_3COOCH_2CH_3$

(ii) $CH_2 = C(Br) - CHCH_3$

(b) The structure below shows some reactions starting with ethanol. Study it and answer the questions that follow:



Compound **U**

(c) Write the formula of the organic compounds **P** and **S**

(ii) Name the type of reaction, the reagent(s) and condition for the reactions in the following steps :-
(I) Step I
(II) Step II
(III) Step III

(iii) Name reagent **R** .....

(iv) Draw the structural formula of **T** and give its name

(v) (I) Name compound **U**.....

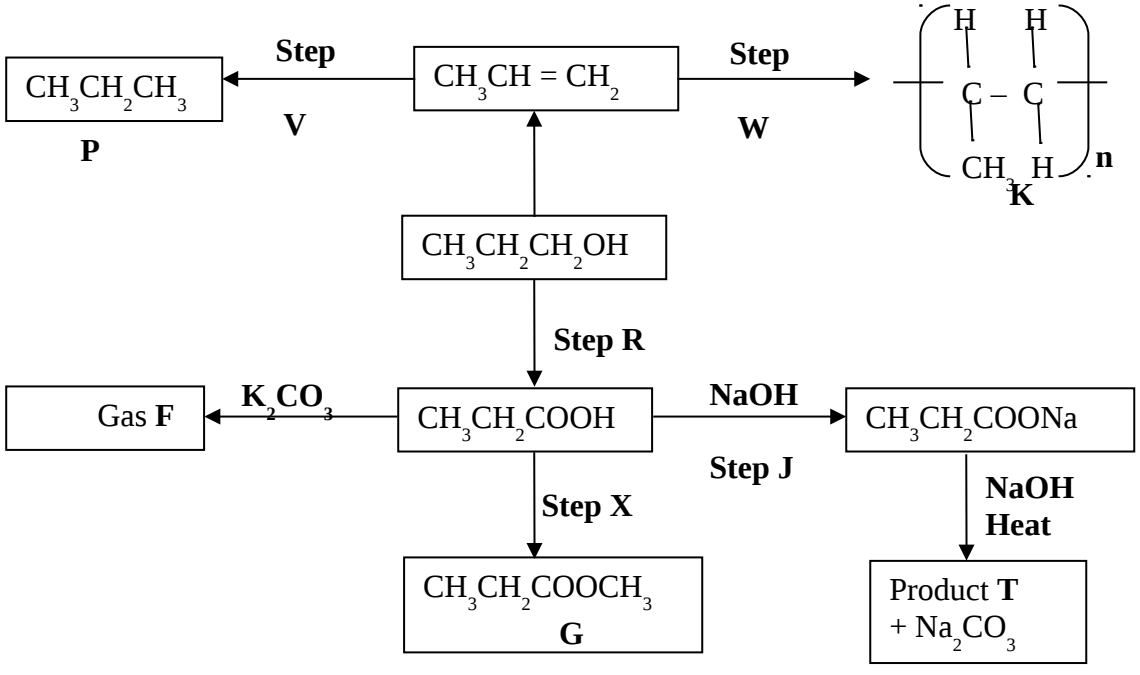
(II) If the relative molecular mass of **U** is 42000, determine the value of n (**C**=12, **H**=1)

(iii) State why C_2H_4 burns with a more smoky flame than C_2H_6

12. a) State **two** factors that affect the properties of a polymer

b) Name the compound with the formula below :
$CH_3CH_2CH_2ONa$

c) Study the scheme below and use it to answer the questions that follow:-



i) Name the following compounds:-

I. Product **T** ..... II. **K** .....

ii) State **one** common physical property of substance **G**

iii) State the type of reaction that occurred in step **J**

iv) Give **one** use of substance **K**

v) Write an equation for the combustion of compound **P**

vi) Explain how compounds CH_3CH_2COOH and $CH_3CH_2CH_2OH$ can be distinguished chemically

vii) If a polymer K has relative molecular mass of 12,600, calculate the value of n (H=1 C =12)