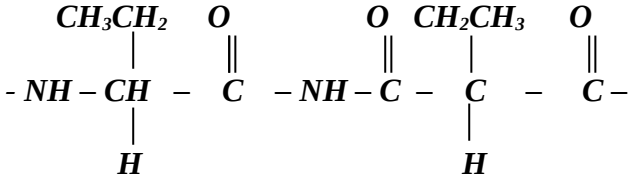
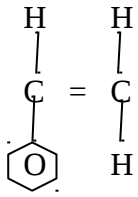
Organic chemistry II (alkanoic acids and alkanols)

1. *(i) Ethylbutanoate*
   (ii) $CH_3CH_2CH_2$ $C(=O)-O-CH_2-CH_3$
   (iii) Esters
2. *a)* $-CH-CH-CH_2-CH(-O-)-CH_2-CH-CH_2-CH$
   b) Polypheny/ ethane
3. *Plastics may contain chlorine or fluorine compounds apart from hydrogen and carbon when burnt, fluorine and chlorine compounds are released into the air destroying Ozone layer*
4. $(NH_4)_2CO_{3(s)} \longrightarrow 2NH_{3(g)} + CO_{2(g)} + H_2O_{(l)}$
5. *The first amount of soap precipitates* $Ca^{2+}_{(aq)}$ *and* $Mg^{2+}_{(aq)}$ *ions and soften water.*
   Then additional soap dissolves oil from the fabric.
6. *a)*



   b) 0.00005mol. P = 0.515 g of monomer.
   = 1.0 mole of poly mer = $\frac{1X\ 0.515}{0.0005}$ *= 10300 g*
   RFM $(C_4H_9ND_2)n$ *= 48 + 9 + 32 = 103*
   $= (C_4H_9NO_2) = 10300$
   $103n = 10300$
   $\therefore n = 100$ *molecules*
7. *Agent A – magnesium salt formed is soluble hence doesn't form scum*
8. *(a) Styrene/Phenylethene*



   (b)Addition polymerization
   (c) – can be made into different shapes easily
   - are cheaper
   - are not corroded by acids, alkalis or air
   - are stronger and long lasting
   - are water-proof
   Any 1 correct
9. *– Add water to the mixture and shake where ethanol dissolves in water while pentane is immiscible.*

**MAT*

- Transfer the mixture in a separating funnel and allow it to settle when pentane floats on top of water-ethanol mixture.

**MAT*

- Turn on the tap to collect water-ethanol mixture while pentane remains in the separating funnel.

- Separate ethanol from water by fractional distillation based on the differences in boiling points.

10. *(a) Is 100% ethanol/is pure ethanol without water in it*
    (b) 30^oC *and yeast*

✓1

11. *(a) (i) Ethylethanoate.*

(ii) 2 – bromobut – l – ene

(b) (i) P – $CH_3COOCH_2\ CH_3$

S – CH_3CHONa

(ii) I. Step I -Type – dehydration.

Reagent – Concentrated sulphur acid.

II. Step II- Type – Oxidation

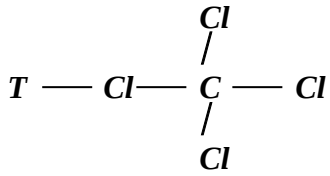
Reagent – acidified potassium magnate VII/ Potassium dichromate (VI)

III. Step III- Type – Hydrogenation

Reagent – Hydrogen

(iii) R – Soda lime

(iv)



Tetrechloromethane

(v) I – U – Polythene/Polyethene

II – 28n = 42000

$n = \frac{42000}{28} = 1500$

(c) – It is unsaturated.

12. *a)* *- The length of the chain*

- Intermolecular forces

- Cross linking of the molecules *(Any two correct = 2 marks)*

b) Sodium propoxide

c) *i) I – T is ethane*

II – K is polypropene

ii) has a sweet smell

iii) Neutralization

iv) *- Used to make ropes √ 1 mark*

- Used to make crates of bottles

- Used as surface for all weather football and hockey pitches *(Any correct use)*

v) $CH_3CH_2CH_3 + SO_2$ _____ $3CO_2 + 4H_2O$

(N.B ignore state symbols)

vi) React a small sample of each of the two substances with sodium carbonate separately. Bubbles// efferrescence are observed with CH_3CH_2COOH and no reaction with $CH_3CH_2CH_2OH$

vii) RMM of monomer = 42 √ ½

$$42n = 12600$$

$$N = \frac{12600}{42} = 300 \surd \text{ ½}$$