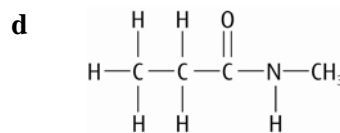
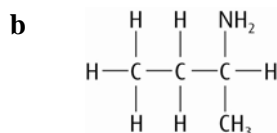
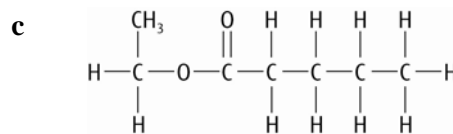
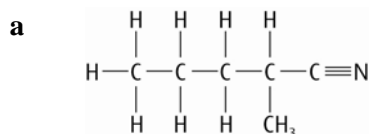


AHL Worksheet – Chapter 10

1 Name the following molecules:

[4]

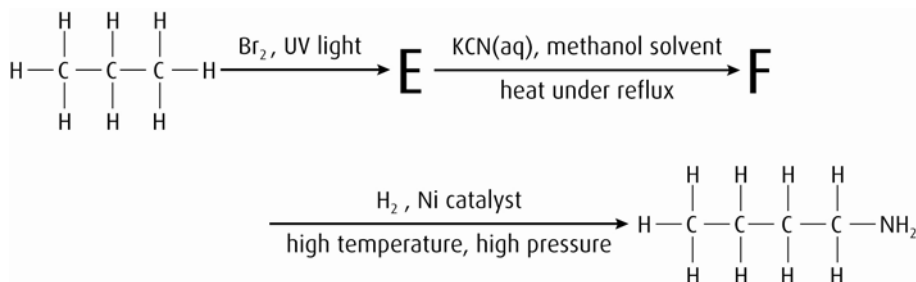


2 Explain why 2-bromo-2-methylpropane is much more likely to react with the cyanide ion via an S_N1 mechanism than an S_N2 mechanism.

[4]

3 Draw the structural formulas and give the names of the missing organic compounds in the following reaction sequence:

[4]



4 **a** Draw the structure of the organic product formed when 2-bromopropane is heated with a concentrated solution of potassium hydroxide in ethanol.

[1]

b Draw out the mechanism for this reaction.

[3]

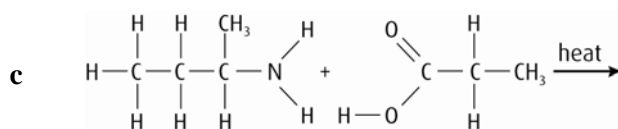
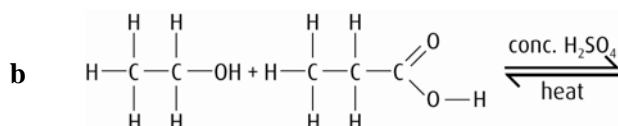
c How many different organic products will be formed when 3-bromopentane is heated with a concentrated solution of potassium hydroxide in ethanol.

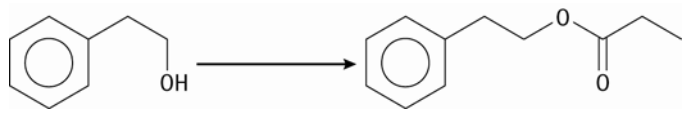
[1]

5 Complete the following equations:

[6]

a propan-1-ol + ethanoic acid $\xrightarrow[\text{heat}]{\text{conc. H}_2\text{SO}_4}$



- 6 a Explain the differences between condensation polymerisation and addition polymerisation. [2]
- b Draw the repeat unit of the polymer formed when each of the following react: [2]
- i
- $$\begin{array}{c} \text{O} \\ \parallel \\ \text{C} - \text{C} - \text{C} - \text{C} \\ \mid \quad \mid \quad \mid \\ \text{H} \quad \text{H} \quad \text{CH}_3 \\ \mid \quad \mid \quad \mid \\ \text{HO} \quad \text{H} \quad \text{OH} \end{array} + \begin{array}{c} \text{H} \quad \text{CH}_3 \quad \text{H} \\ \mid \quad \mid \quad \mid \\ \text{HO} - \text{C} - \text{C} - \text{C} - \text{OH} \\ \mid \quad \mid \quad \mid \\ \text{H} \quad \text{H} \quad \text{H} \end{array}$$
- ii
- $$\begin{array}{c} \text{O} \\ \parallel \\ \text{C} - \text{C} - \text{C} - \text{C} \\ \mid \quad \mid \quad \mid \quad \mid \\ \text{H} \quad \text{H} \quad \text{CH}_3 \quad \text{H} \\ \mid \quad \mid \quad \mid \quad \mid \\ \text{HO} \quad \text{H} \quad \text{OH} \end{array} + \begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \\ \mid \quad \mid \quad \mid \\ \text{H}_2\text{N} - \text{C} - \text{C} - \text{C} - \text{NH}_2 \\ \mid \quad \mid \quad \mid \\ \text{H} \quad \text{H} \quad \text{H} \end{array}$$
- 7 Draw out reaction sequences showing structural formulas and all reagents and conditions for the following conversions: [8]
- a 1-chloroethane to propylamine (propan-1-amine)
- b ethanol to *N*-ethylethanamide
- c
- 
- 8 a Select the molecules from the list below that will exhibit geometrical isomerism. [3]
- but-1-ene but-2-ene 2-methylpropene 2-methylbut-2-ene**
- 4-methylpent-2-ene 1,3-dichlorocyclobutane 1,1-dimethylcyclobutane**
- b For those molecules in part a that exhibit geometrical isomerism, draw out and label the *cis/trans* forms. [3]
- c Draw and give the full names of all isomers of C₅H₁₀. [10]
- 9 a Select molecules from the following list that will exhibit optical isomerism. [3]
- butan-1-ol propan-2-ol pentan-2-ol**
- butan-2-amine 2-methylbutanenitrile 2-methylpropanoic acid**
- butanone 3-chloro-3-methylbutanal**
- b For each of the molecules in part a that exhibits optical isomerism, draw out clear three-dimensional diagrams showing the enantiomers. Mark chiral centres with a *. [6]
- c Draw all the isomers of C₅H₁₂O that exhibit optical isomerism. [3]
- d Explain how optical isomers may be distinguished from each other using a polarimeter. [3]