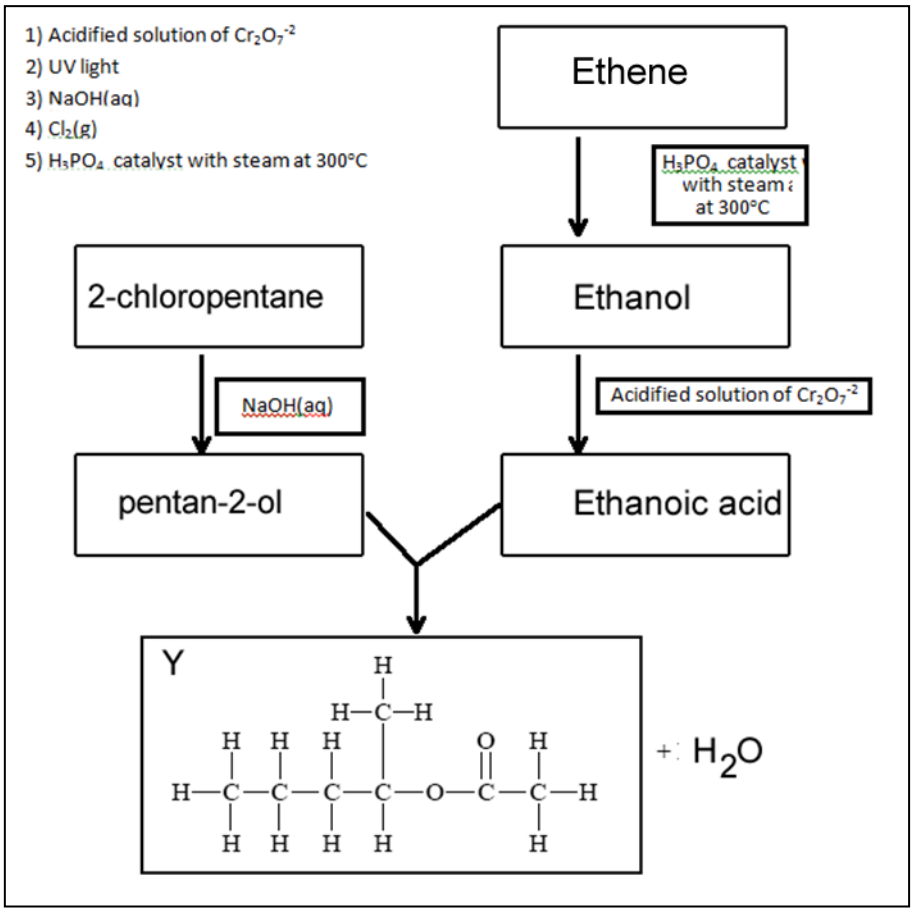
Friday Worksheet **Name: …….**
Analytical chemistry revision 3

1) A reaction pathway is designed for the synthesis of the compound that has the structural formula shown below. Inorganic reagents used are also listed from 1 to 5.



a) Identify the following

i. A
ii. B
iii. C
iv. D
v. X

b) Select the reagents needed for the following reactions

i. A --- -----> B
ii. Ethane --- -----> C
iii. C --- -----> D

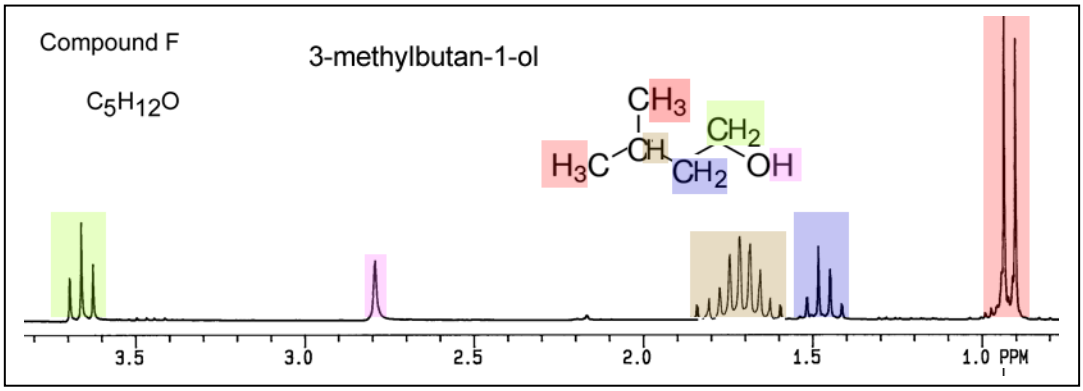
c) What type of reaction produces compound :

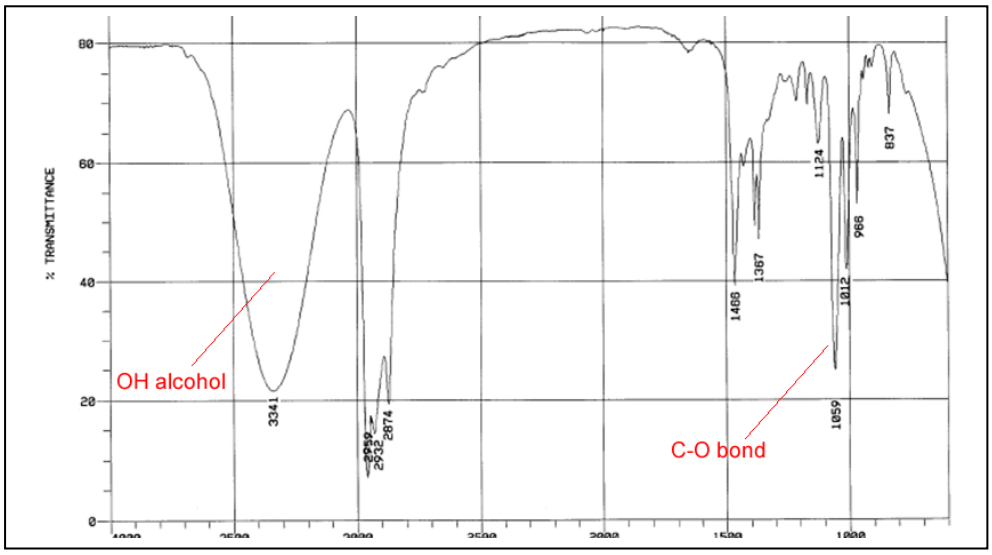
i. Y
ii. D
iii. B

2) Compound F and compound B have the same molecular formula. The ^{1}H NMR and IR spectra of compound F are shown below. A student suggested that compound B and compound F are the same compound. Using the information below argue for and against this suggestion.

Compound B is pentan-2-ol whereas compound F is 3-methylbutan-1-ol

The ^{1}HNMR spectrum of pentan-2-ol has 6 hydrogen environments whereas the spectrum below has 5.





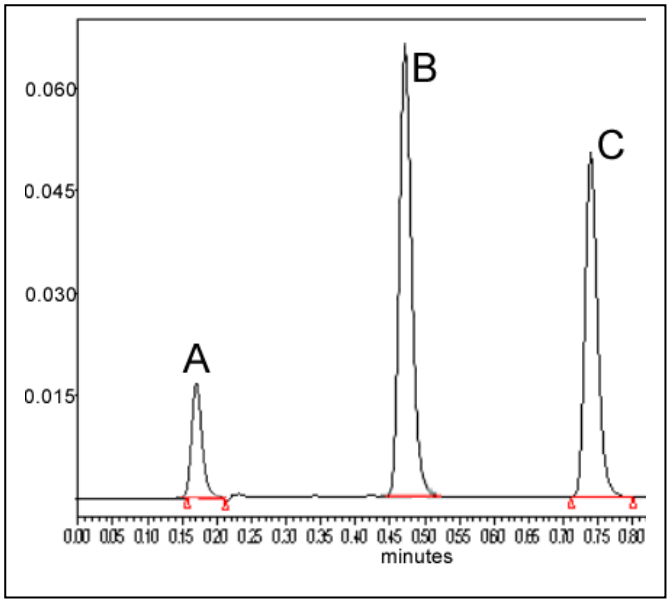
3) A mixture of three compounds, propan-1-ol, pentan-1-ol and pentan-3-ol was placed in a HPLC column filled with beads covered with a non-polar substance. A polar solvent was used to move the mixture through the column.

a) Using the chromatogram, shown on the right, identify the substances A, B and C.

A= ethanol, B = pentan-3-ol, C =pentan-1-ol

The less polar the molecule the greater the retention time as it interacts more with the stationary phase and less with the mobile phase.

The smaller the alcohol the more polar the molecule. Secondary alcohols are less soluble than primary alcohols.



b) What can you say about the amount of each substance present in the mixture?

The area under the curve is indicative of the amount of substance present.

There is approximately 4 times more B than A