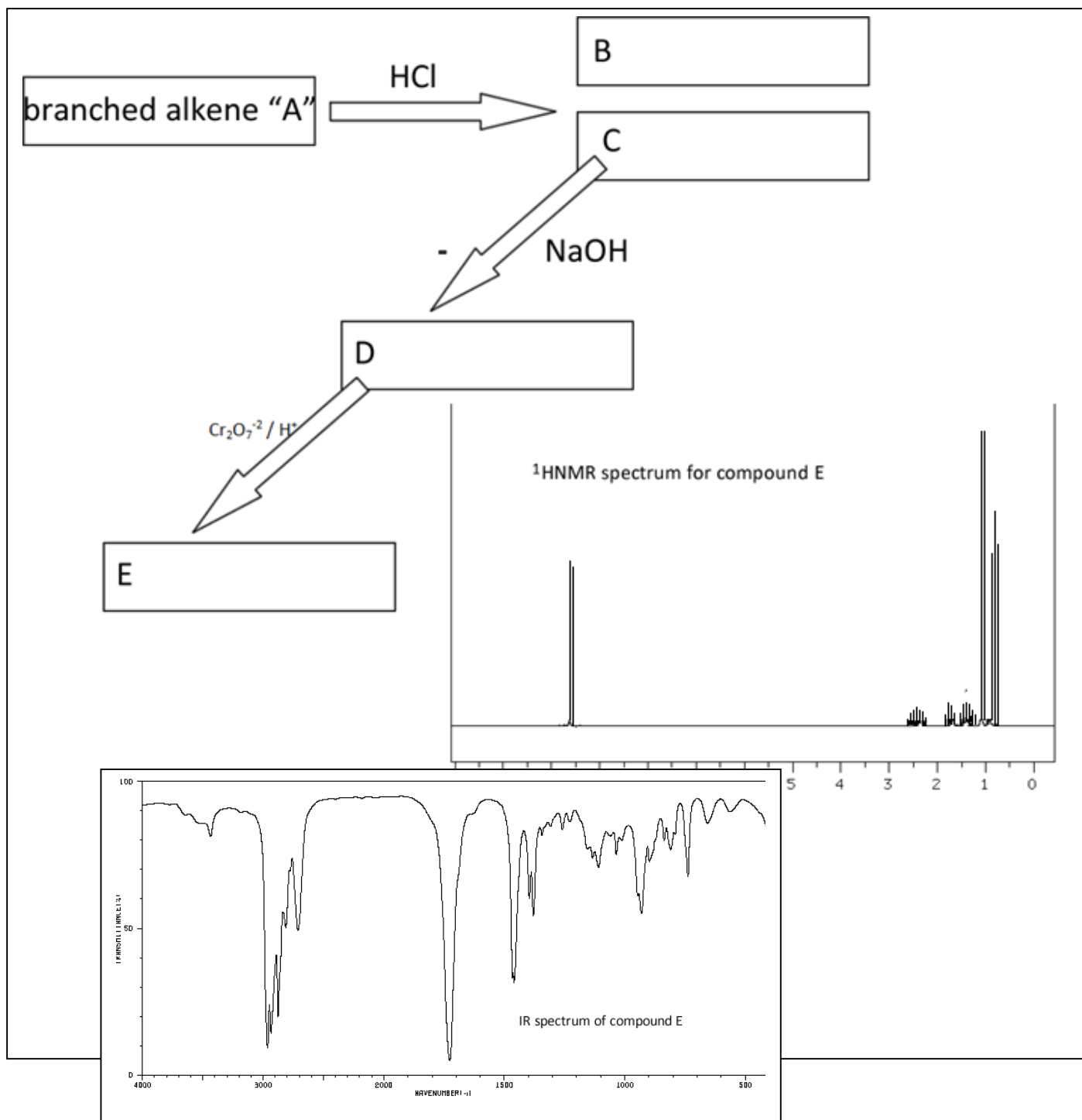


Friday worksheet 5 – organic pathways, naming organic compounds, IR and ^1H NMR spectroscopy

- 1) A branched alkene with molecular formula C_6H_{12} is used to produce compound E via the reaction pathway shown below.
 - a) Draw the structural formula of compound E given the information below.
 - b) Name and draw the structural formulae of the compounds D, C and B in the spaces below.
 - c) Give the systematic name of compound A.

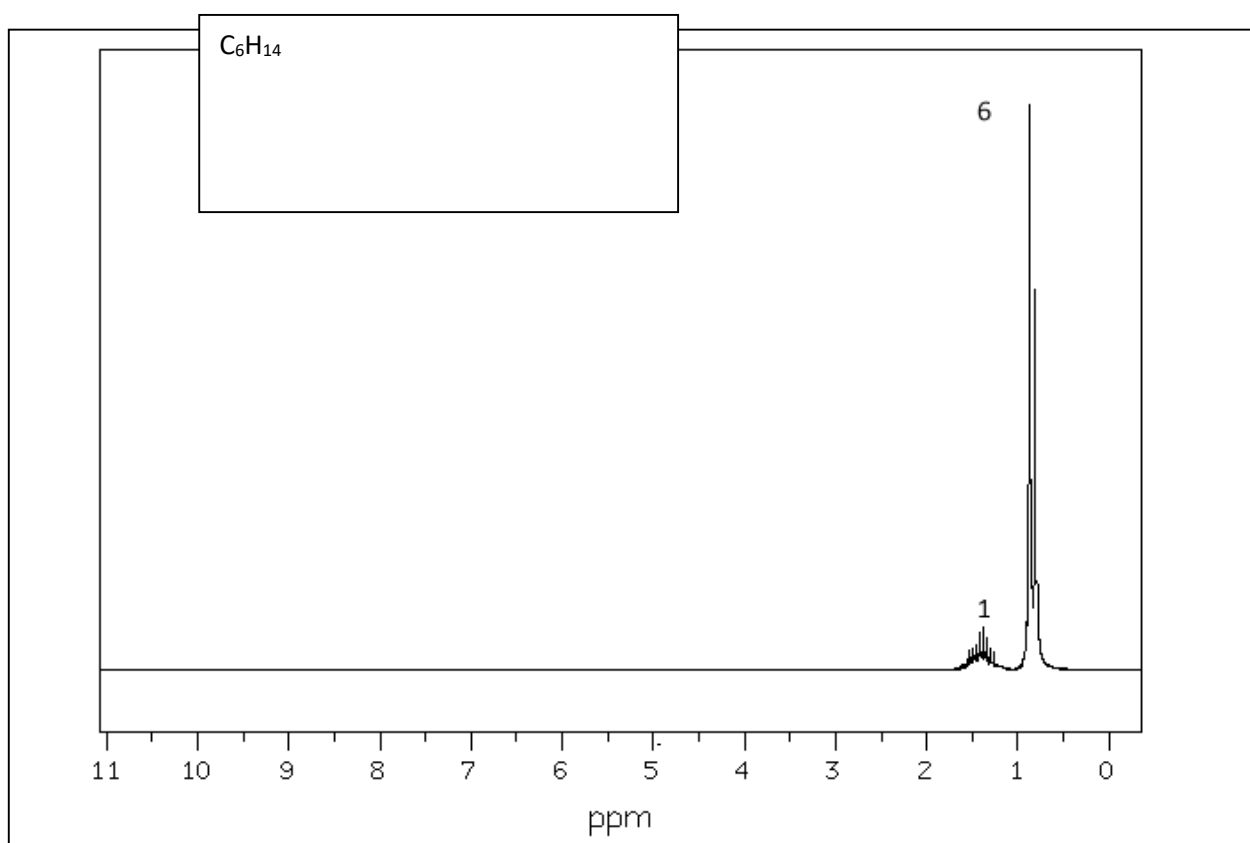


d) After looking at the IR spectrum above of compound E a student suggested it could be either an acid, a ketone or an aldehyde.

i. Suggest a reason why the student came to that conclusion.

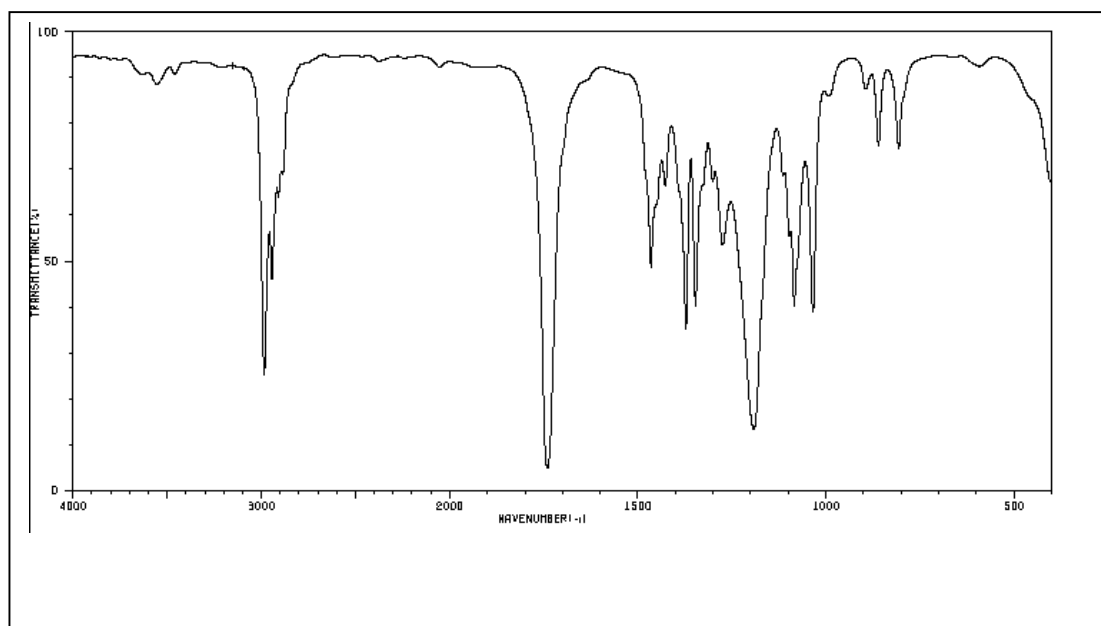
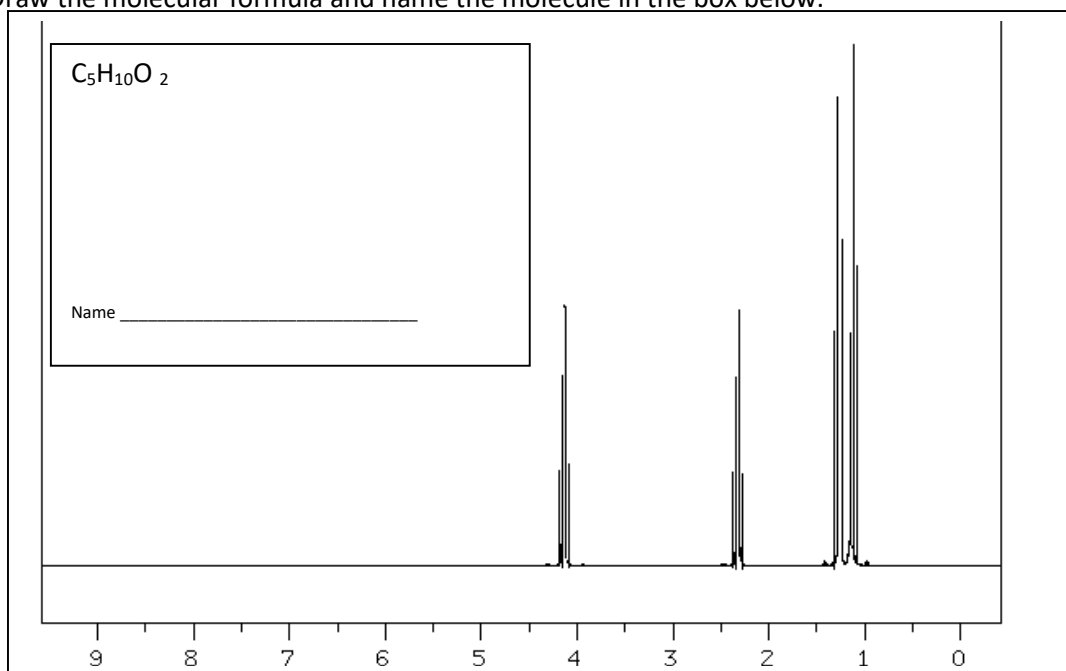
ii. Suggest to which group of organic compounds, mentioned by the student in question i. above, does compound E NOT belong to. Give a reason for your answer.

- 2) A compound with the formula C_6H_{14} has the 1H NMR spectrum shown below. Identify the compound using the n+1 rule and draw its skeletal structure in the space provided.
Note – this spectrum has been slightly modified for the n+1 rule. The signal at 1.4 ppm is split into more peaks than are shown on the spectrum. The simplest ratio of the area under each peak is also shown.



3) The ^1H NMR and the IR spectra of a compound with the molecular formula $\text{C}_5\text{H}_{10}\text{O}_2$ are shown below.

a) Draw the molecular formula and name the molecule in the box below.



b) Consider a compound with the same molecular formula ($C_5H_{10}O_2$) as the compound in a) above. It's IR and 1H NMR spectra are shown below. Draw it's molecular formula.

