

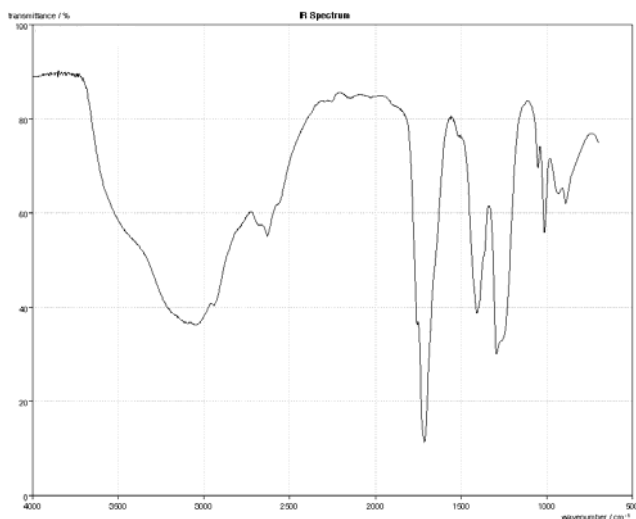


# STARTER FOR 10...

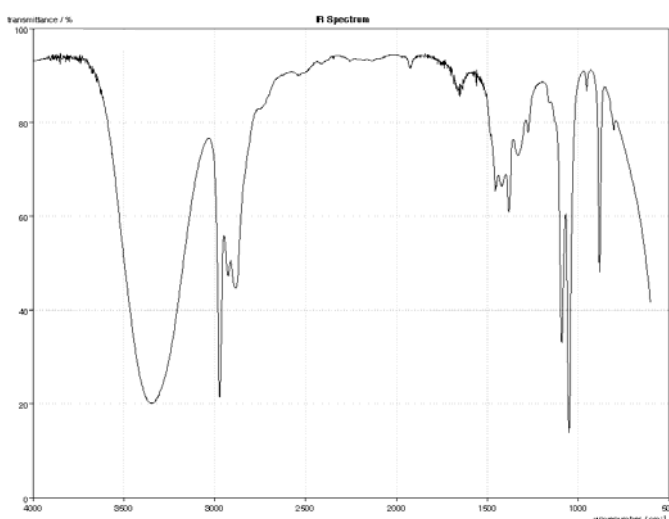
## 10.2. Infra-red spectroscopy

Help! The computer has gone crazy and mixed up all my spectra. Can you use the infra-red spectra together with the empirical formula to help me identify the compounds A - D below;

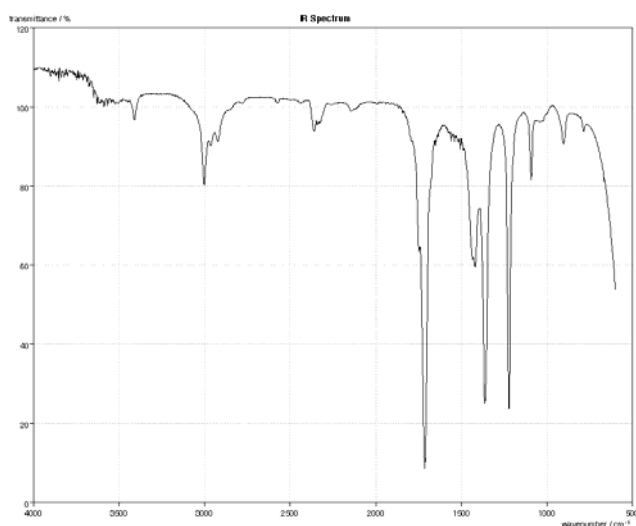
Compound A,  $C_2H_4O_2$



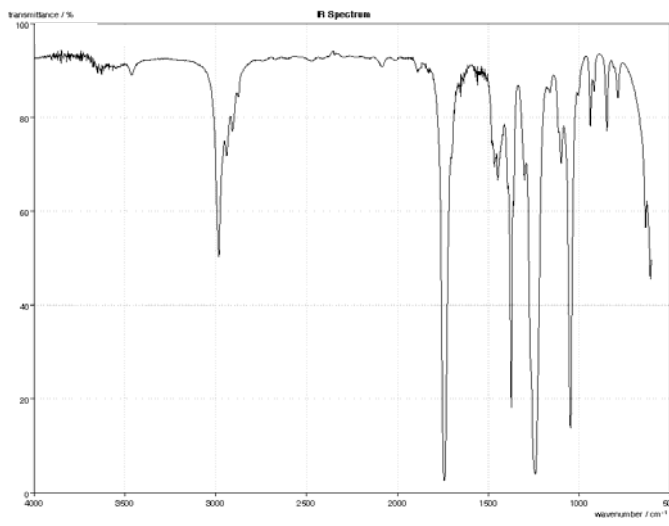
Compound B,  $C_2H_6O$



Compound C, Empirical formula  $C_3H_6O$



Compound D, Empirical formula  $C_4H_8O_2$



### BONUS MARKS

There is more than one possible structure for **compounds C and D**. Can you suggest an alternative structure for each which is still compatible with the infra-red spectrum provided?

## 10.2 Infra-red spectroscopy

*Compound A* = **ethanoic acid** (1 mark for molecule with C-H, O-H and C=O, 1 mark for correct structure)

*Compound B* = **ethanol** (1 mark for molecule with C-H and O-H, 1 mark for correct structure)

*Compound C* = **propanone** (1 mark for molecule with C-H and C=O, 1 mark for correct structure)

*Compound D* = **ethyl ethanoate** (1 mark for molecule with C-H and C=O, 1 mark for correct structure)

Possible alternative structures for;

*Compound C* = propanal (1 mark)

*Compound D* = methyl propanoate, propyl methanoate or *iso*-propyl methanoate (1 mark)