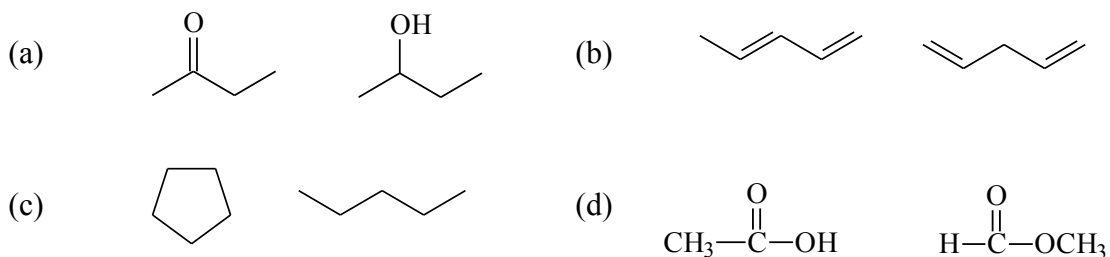
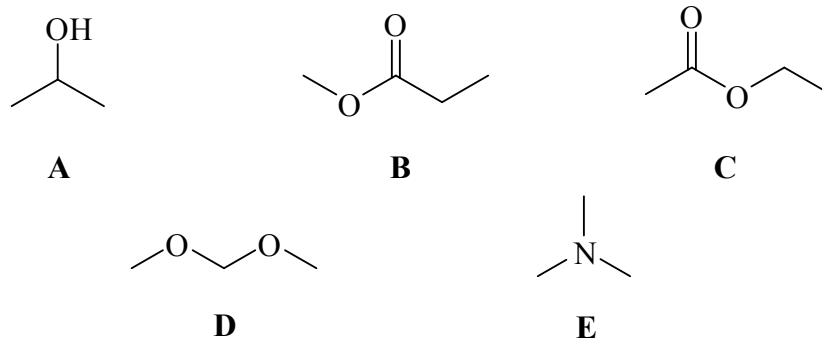


See the 'Organic Spectroscopy' website for more information and practice:
<https://scilearn.sydney.edu.au/OrganicSpectroscopy/>

1. Which spectroscopic technique would most readily distinguish between the following pairs of compounds? Give a brief reason.

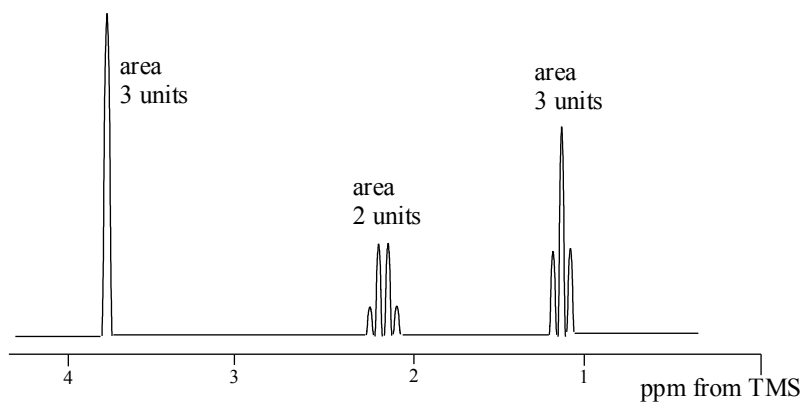


2. Consider the following molecules, A - E.

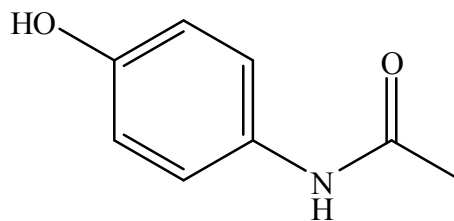


More than one answer may be correct. Give all correct answers.

- (a) Which of the molecules would give three signals in the ^1H NMR spectrum?
 (b) Which of the molecules would possess a ^1H NMR spectrum consisting of only one resonance?
 (c) Which of the molecules would possess a ^1H NMR spectrum consisting of two signals in the ratio 1:3?
 (d) How many singlets would be observed in the ^1H NMR spectrum of **D**?
 (e) Which of the molecules would possess a ^1H NMR spectrum containing a singlet, a triplet and a quartet signal?
 (f) Examine the ^1H NMR spectrum below. To which of the compounds does it belong? (Hint: See page E35-11 of the Laboratory Handbook for approximate chemical shifts.)



3. By first considering the number and type of ^1H environments, *sketch* the ^1H NMR spectra you would expect for paracetamol. You only need to consider the protons bonded to carbon.
(Hint: See page E35-11 of the Laboratory Handbook for approximate chemical shifts.)



paracetamol

4. Draw the major products of the following reactions. Write "NR" if there is no reaction.

