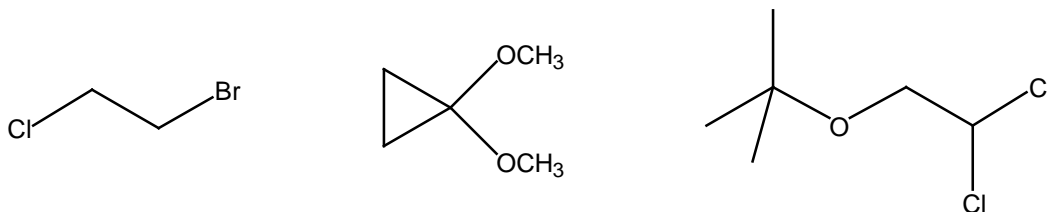
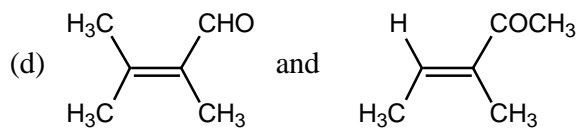
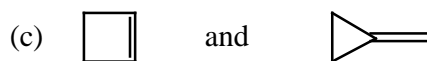
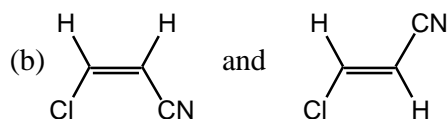
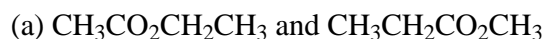


Problem Set #5
CH241-2001F

- [1] Examine each of the following compounds and,
(a) predict the number of signals in its proton NMR spectrum
(b) rank the signals according to chemical shift (1 being the most upfield)
(c) provide a ratio of the integrals where appropriate, and
(d) indicate the splitting pattern of every signal



- [2] Explain how you would distinguish between the two compounds in each of the following pairs by ^1H NMR spectroscopy.



- [3] Give structures for:

- (a) A compound of the formula $\text{C}_3\text{H}_3\text{Cl}_3$ that shows only one signal in its ^1H and ^{13}C NMR.
(b) A compound of the formula C_6H_{12} that has only one signal in its ^1H NMR but two signals in its ^{13}C NMR.
(c) A compound of the formula $\text{C}_3\text{H}_8\text{O}$ that gives the following spectral data: ^1H NMR (CDCl_3) 0.9 (t, $J = 7$ Hz, 3H), 3.4 (s, 3H), 3.8 (q, $J = 7$ Hz, 2H); ^{13}C NMR (CDCl_3) 14.4, 53.6, 65.2.

- [4] A molecule of the formula $C_5H_{10}O$ gives the 1H and ^{13}C NMR spectrum shown below. What is the structure of this molecule?

$C_5H_{10}O$

