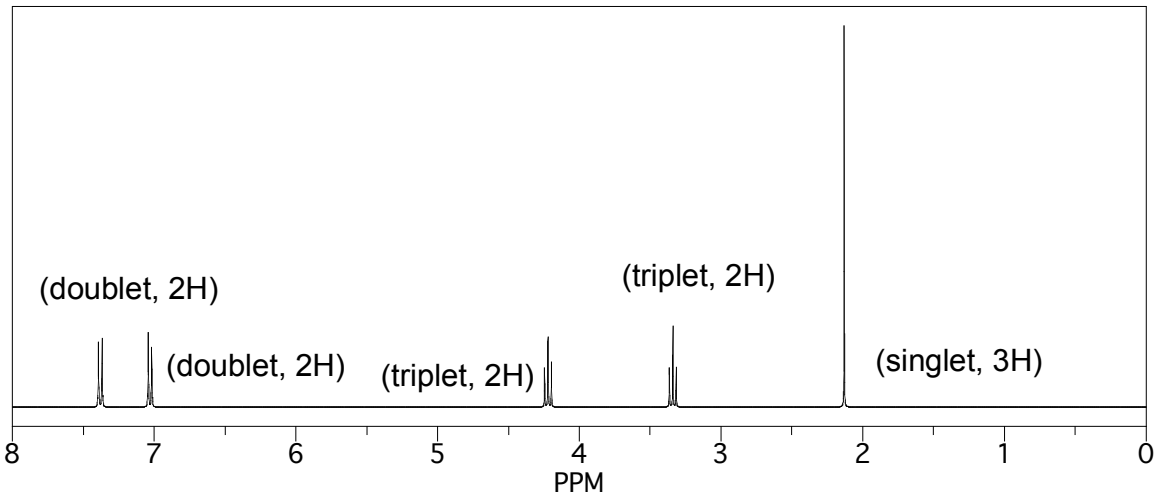
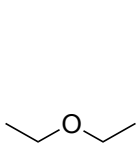
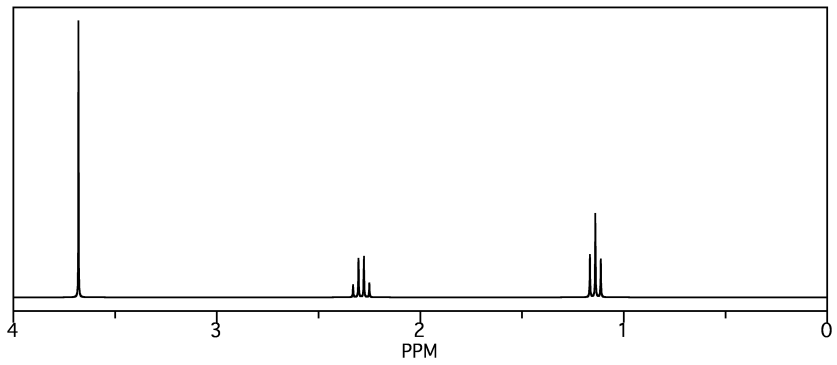
1. A compound is analyzed by ^{1}H NMR spectroscopy. The compound has the formula $C_9H_{11}Br$. Propose a structure for the compound and match the peaks of the spectrum to the H's in the compound. ***Remember to start by determining degrees of unsaturation!***

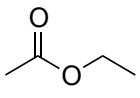
The ***doublets are related to each other*** and ***the triplets are related to each other.***

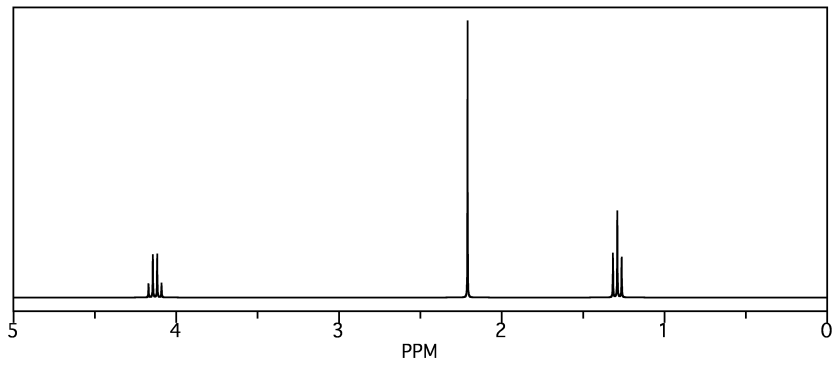


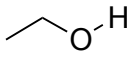
2. Draw connecting lines to match the compounds to their ^{1}H NMR spectra. Note that for one compound no spectrum is shown. ***You need not show assignments of the NMR signals.***

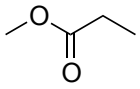


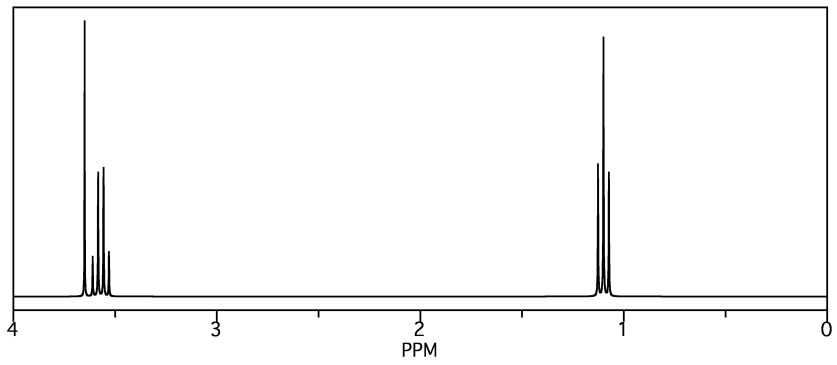




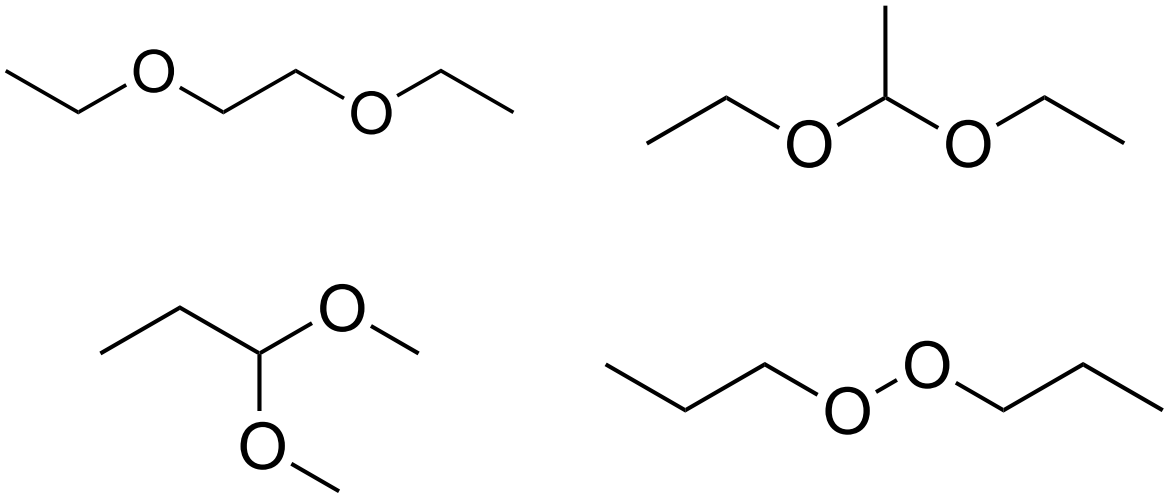


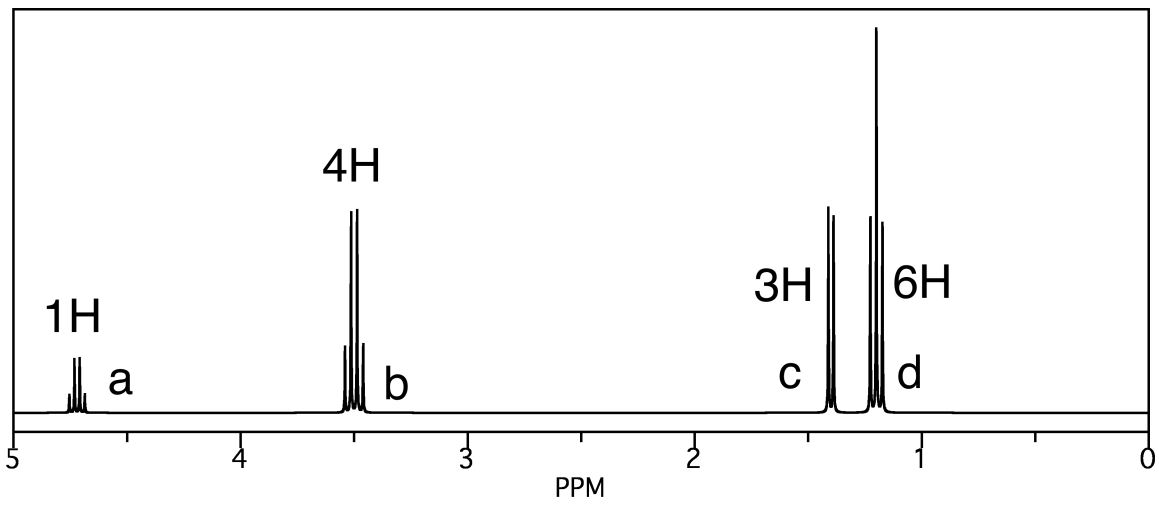






3. Which of the following compounds gives the NMR spectrum shown? Select the compound and ***ASSIGN a, b, c, d*** from the NMR spectrum to hydrogen environments on the molecule. (***HINT:*** peaks **a** and **c** are related; peaks **b** and **d** are related.)





4. Draw the structure of the molecule that has molecular formula $C_5H_{10}O_2$ and the ^1H NMR spectrum shown below. Assign the peaks in the spectrum to hydrogens in the molecule. Integrations showing number of Hs are shown under the peaks. Ignore the impurity signal marked with an "X" and the signal for $SiMe_4$, which defines the position of 0.00 ppm.