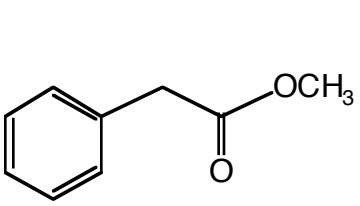
Answers to Problem 73, Chemistry 301X - 2006

First of all, the IR tells you that there is a C=O, probably an unconjugated ester (strong peak at ~1740 cm^{-1}). The C-O strong stretch is also there at about 1250 cm^{-1}.

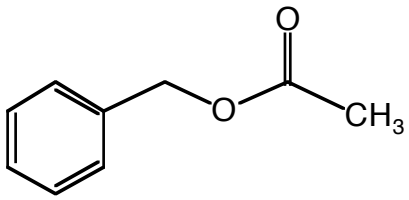
The Mass Spectrum shows an appropriate parent peak at *m/e* = 150.

It is the proton NMR that is most useful. First of all there is a set of 5 hydrogens at δ 7.3, a position diagnostic for hydrogens attached to a benzene ring. There is a 3H signal at δ 1.9, surely a methyl group, and very likely one attached to a C=O. Two other hydrogens appear as a singlet at δ 5; they must be highly deshielded by something.

Putting all the parts together leads to two possibilities:



A



B

It must be **B** because there is no signal low enough to be an OCH_3 (where should that come?). Why are the five aromatic hydrogens all in one signal when they should show three peaks? The machine just couldn't resolve the signals.