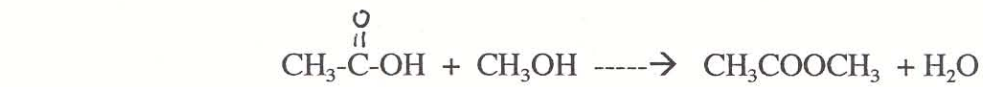
1. Identify the following compound on the basis of the IR and H NMR information given below.
$C_{10}H_{16}O_6$ IR 1740; NMR δ 1.3 triplet, (9H); δ 4.2 quartet, (6H); δ 4.4 singlet, (1H).

2. Write a mechanism for the esterfication reaction shown below



3. Suggest a structure for an unknown compound $C_9H_{10}O$ that exhibits a strong IR absorption at 1710 cm^{-1} and has a H NMR spectrum of three singlets at δ2.1 (3H), δ3.7 ((3H), and δ7.2 (5H).

4. While organizing the organic lab, Jason Hampe, found a bottle labeled "STUDENT PREP". Jason ran a GC/MS of the liquid in methylene chloride and got the spectra below. When he saw the spectra he said, " I see something that gives me a good idea what it is".

   a) What did Jason see that gave him confidence in his guess?

   b) What is the structure of the compound?

   c) Suggest the structure of the fragments at mass 107, 93, and 57.

   d) Why is the 57 peak the base peak?