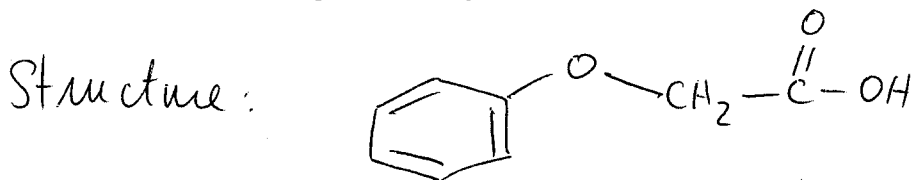


5. An unknown organic compound has the mass, IR, and NMR spectra shown on the next page.

a) In the space below, deduce the structure of the compound from the data and explain your reasoning. Make sure to include relevant data from the mass and IR spectra in your logic. The majority of the credit comes from reasoning, and not whether the final structure is itself correct.

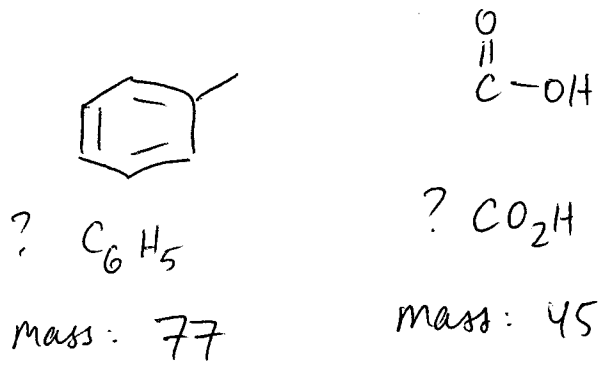
Include in your answer your assignments of the NMR peaks (both  $^1\text{H}$  and  $^{13}\text{C}$ ) to the structure. Is there a peak missing? (10 marks)



Reasoning: mass spectrum indicates MW of 152 g/mol.  
 IR spectrum indicates  $\text{RCO}_2\text{H}$  (see Fig 18.1 p 819)  
 $^{13}\text{C}$  NMR spectrum indicates 6 types of C atoms  
 $^1\text{H}$  NMR spectrum indicates AROMATIC signals.

integration 2:3:2 ← VERY IMPORTANT INFO

PIECES



$77 + 45 = 122$

left:  $152 - 122 = \underline{30}$

30 mass units

O	16	$\text{CH}_3$	15
$\text{CH}_2$	14	$\text{CH}_3$	15
	<u>30</u>		<u>30</u>

~~inconsistent with  $^1\text{H}$  NMR~~