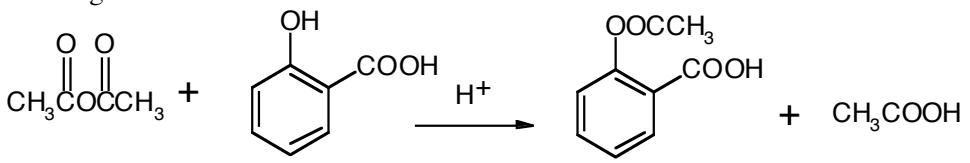
Names: _____

Introduction to Organic Synthesis (Final Report)

Complete the following information.



Mass			
Actual (g) _____	_____		
moles	_____	_____	_____
Theoretical (g)			_____
Actual (g)			_____
Percent Yield			_____%
m.p. ^{o}C (experimental)			_____

$$\text{Percent Yield} = \frac{\text{Actual Yield (g)}}{\text{Theoretical Yield (g)}} \times 100\ \%$$

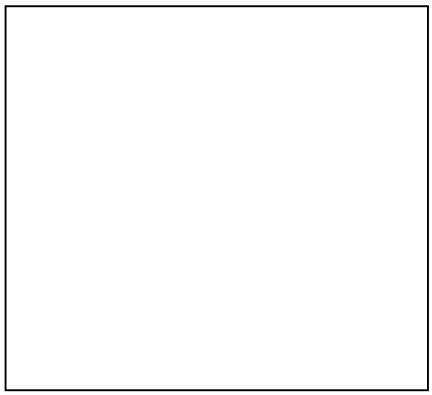
Briefly explain how the $FeCl_3$ test for the presence of phenols could be used to determine how long the reaction flask should be heated. Would this method be preferred over IR analysis? Explain your answer.

UNKNOWN structures: IR-NMR data assignments

Draw a condensed formula for your individual unknown with all of the hydrogen atoms drawn in the structure. On the left of the structure assign the IR peak(s) to the corresponding feature(s) in the structure and on the right assign the ^{1}H NMR peaks using respective chemical shift values and splitting patterns to clearly identify the labeled hydrogen atoms in the structure. Attach the original spectra to the report pages.

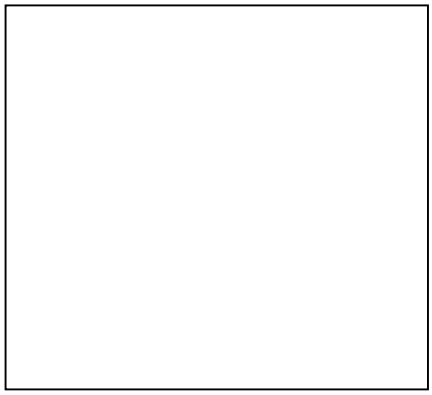
Student Name: _____ *Unknown Number:* _____

IR: ^{1}H NMR:



Student Name: _____ *Unknown Number:* _____

IR: ^{1}H NMR:



The following questions can be answered from reading:
http://chemconnections.org/general/chem121/aspirin-econ-8-9-97.html

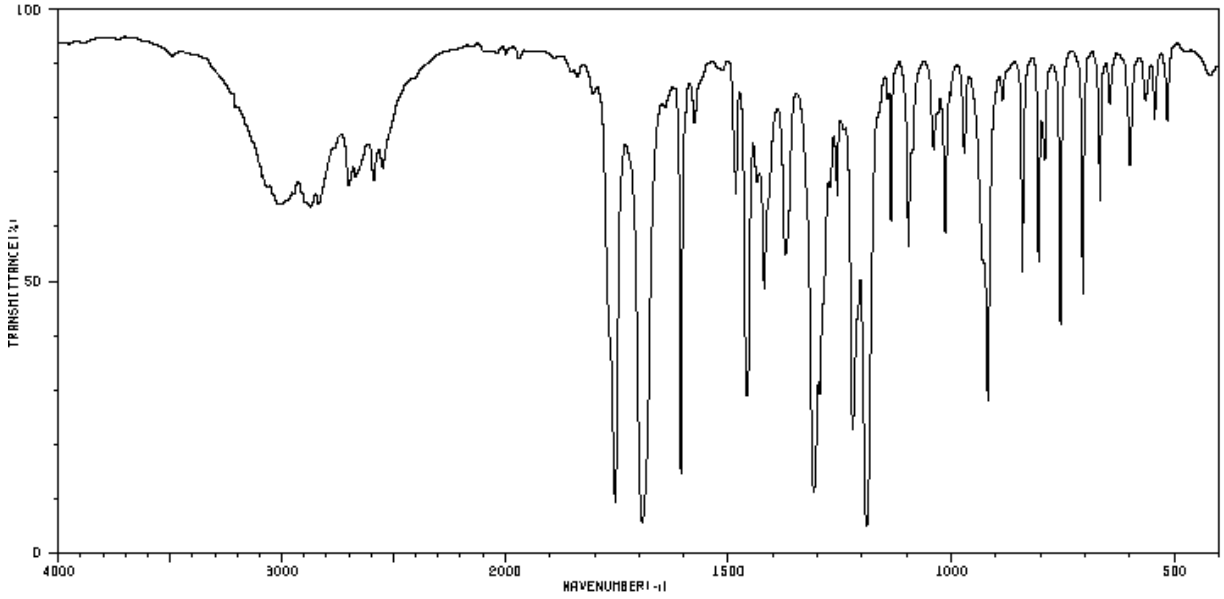
5. What did Edward Stone, vicar of Chipping Norton, Oxfordshire, discover?

6. If each aspirin tablet that Bayer sold in the article contained 250 mg of pure aspirin, how many metric tons of pure aspirin would Bayer need to produce to meet their annual total sales of tablets? Show your calculations.

How many tons of salicylic acid would you order as chief production chemists to make this amount? Breifly explain your answer.

The IR and NMR of pure aspirin are provided on the following page. Draw the structure of aspirin. Assign the IR peak(s) to the corresponding feature(s) in the structure. Label each hydrogen in the structure and clearly assign the ^{1}H NMR peaks to them using respective chemical shifts and splitting patterns.

KBr pellet


100
50
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TRANSMITTANCE[%]
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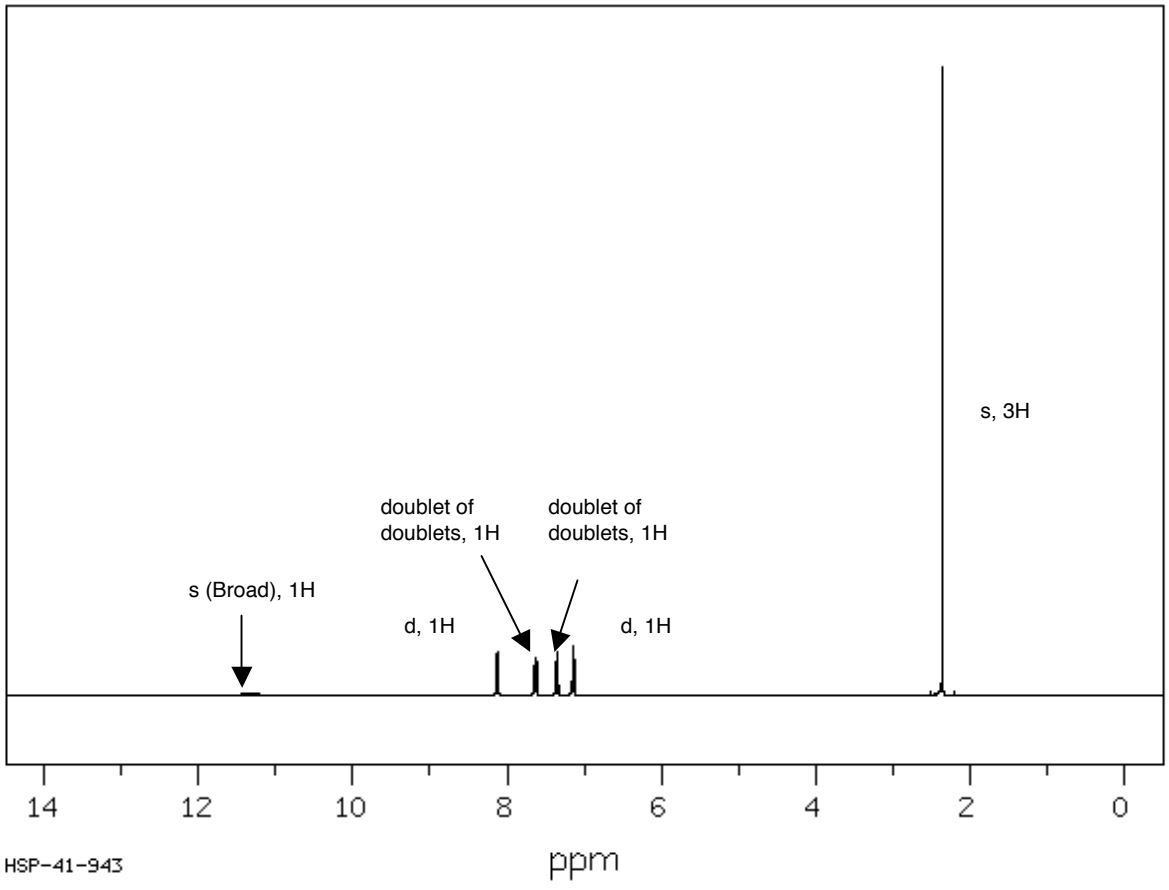
3000
2000
1500
1000
500
WAVENUMBER[-1]


s, 3H
doublet of
doublets, 1H
doublet of
doublets, 1H
s (Broad), 1H
d, 1H
d, 1H
14
12
10
8
6
4
2
0
HSP-41-943
ppm