

EXPERIMENT 5: DATA SHEET**Electrophilic Aromatic Substitution: A Friedel-Crafts Acylation Reaction**

DUE: The week of March 19, 2007 – during your lab. This will allow time to analyze the NMR and IR spectra.

Name:	
Lab Section:	
Demonstrator:	

UNKNOWN Aromatic= A, B, C, or D

After determining the identity of your unknown aromatic draw the reaction equation showing the structures of starting material and possible products. Be sure to name the compounds using IUPAC rules:

Calculate your yield:

Acetyl chloride: Molecular Weight = _____

Volume used = _____

Grams used = _____

Moles used = _____

Unknown Aromatic (____): Molecular Weight = _____

Volume used = _____ Grams used = _____

Moles used = _____

Limiting reagent:

Product:

Molecular Weight = _____ (hint: MW of your unknown + 42)

Moles Expected = _____

Grams expected = _____ (theoretical yield)

Mass of round bottom flask and stopper = _____

Mass of round bottom flask, stopper and products = _____

Net Mass of products obtained = _____

Percentage Yield: = _____

Show calculations on reverse.

Analysis of NMR Spectrum of Product:

Attach your NMR spectra to this Data Sheet. Assign a structure of your product by completely analyzing your ^1H and ^{13}C NMR spectra. In some cases it may be possible to see more than one of the disubstituted benzene products. Be sure to integrate all peaks and assign a relative proportion of the products.

Analysis of Infrared Spectrum:

Attach and analyze the IR spectrum of your products, assigning appropriate peaks. Compare and comment on it compared to the IR spectrum of the starting material (provided in the laboratory). Also use Table 1 in experiment 4 to try to determine (confirm) the substitution pattern of your product (*ortho*, *meta* or *para*).

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Draw a **complete mechanism** of the reaction on your unknown aromatic with acetyl chloride + AlCl_3 accounting for any regiochemistry.