26A:

Observations and Measurements:

In the reaction flask, before reaction the mixture was clear. After a certain point in the heating process, the mixture began to turn yellow. Adding the methanol made the mixture a cloudy white mixture. While acquiring the polystyrene from the mix, the mix slowly turned clearer as the dissolved polystyrene was slowly clumping out.

Table 1: Used Masses

Styrene used: 2.084g	Benzoyl Peroxide used: 0.10g

Table 2: Acquired Mass

Polystyrene Mass: 0.544g

Data and Calculations:

% yield: .554 / 2.084 x 100 = 26.58%

Discussions and Conclusions:

Exercise Questions:

3a. If the benzoyl peroxide was not added, the formation of polystyrene decreases considerably. This is because the benzoyl peroxide is the initiator of the reaction.

3b. Polystyrene is able to dissolved in petroleum ether which lowers the yield.

5.

6.

7.

Nylon Rope Trick:

Observations and Measurements:

When the two different layers were added, a white substance formed at the interface. Pulling the Nylon up, it was a small, white long strand that kept forming as it was pulled.

Table 1: Measurements

Nylon Rope	Total Mass: 0.887g	Longest Strand: 6.5 in

Data and Calculations:

Theoretical: 1mL x 1.121g/mL x 1 mol/239.14g x 1mol/1mol x 282.43g/1mol = 1.324g

Percent yield: .887/1.324 x 100 = 66.99% yield

Discussions and Conclusions:

44A:

Observations and Measurements:

When p-aminobenzoic acid was added to HCl it made a cloudy white solution. When sodium nitrite was added to the solution, it created a clear and yellow mixture. The addition of potassium iodide and water changed the mix into orange then purple-red while foaming. Cooling created two layers of liquids with a purple solid that was collected. Recrystallization turned the solution dark red/maroon in color and the final solid was purple with a hint of red in color.

Table 1: Masses used

P-aminobenzoic acid used: 1.376g	Sodium Nitrite used: 0.688g
Potassium Iodide used: 2.502g	

Table 2: Mass Recorded

Final Solid Mass: 1.066g

Data and Calculations:

1,376g x 1mol/137.1g x 1mol/1mol x 248g = 2.489g

%: 1.066/2.489 x 100 = 42.83%

Discussions and Conclusions:

44B:

Observations and Measurements:

All the solutions that were created were clear in color with the exception of the p-iodobenzoic acid.

Table 1: Sigma and pKa values of various test samples

Sigma	**B.A Derivative**	**Left Group**	**Right Group**
-0.66	Amino B.A	8.37	7.90
-0.37	Hydroxy B.A	7.84	7.62
-0.27	Anisic Acid	7.40	7.42

-0.17	Toluic Acid	7.18	7.14
0.00	Benzoic Acid	6.23	6.42
0.23	Chloro B.A	5.83	5.98
0.45	Terephthalic	5.67	5.78
0.78	Nitro B.A	5.32	5.55-5.65
FIND OUT	Iodo B.A	6.68-6.70	6.62

Data and Calculations:
p-iodoBA: delta pKa: 6.23 - 6.69 = -0.46
Sigma: -0.46 = 2.3 * sigma = -0.2
Discussions and Conclusions:

Exercise Questions:
1. The rho value is 2.3 by the experiment and since it is greater than 1, this shows that the reaction is more sensitive to the substituents that are on the benzoic acid.
2.
3a. If sodium nitrate was used instead of sodium nitrite, nitrous acid would not be obtained which is the conditions the reaction needs to create the product desired.
3b. Titrating the solution to dark red means that the end point of the indicator has been reached a while before so when both samples mix, an equimolar solution would not be created and pKa could not be accurately reported.
3c. If both samples were neutralized, the pH would be extremely basic with no acid left which is required for the correct report of the pKa values.
5.
6a. At this temperature, p-hydroxybenzoic acid can be formed where N2 is created due to the dissociation of the diazonium salt.
6b.
7.
8.
9.

Acetylation of Ferrocene and Purification by Column Chromatography:
Observations and Measurements:

Ferrocene was dark yellow in color and adding phosphoric acid made the solution dark brown in color. The mix that was placed in the ice beaker contained a black tar like substance

and the brown sample. The sample that was vacuum filtered was a light red brown in color and the rotovap process created an orange red product.

Table 1:

Ferrocene used: 1.502g	After RXN weight: 1.158g
Amount used: 0.402g	Rotovap weight:

Table 2: MP

Data and Calculations:
1.502g x 1mol/186.03g x 1mol/1mol x 228.07g/1mol = 1.841g
%: 1.158g/1.841g x 100 = 62.90%

Discussions and Conclusions:

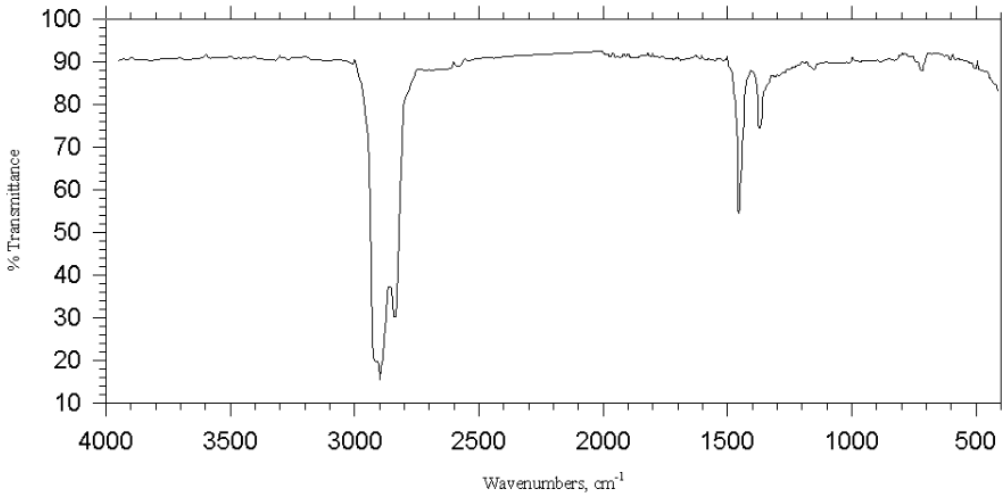

Figure 5. Nujol; thin film (Nujol is a trade name for mineral oil which is a long chain alkane)

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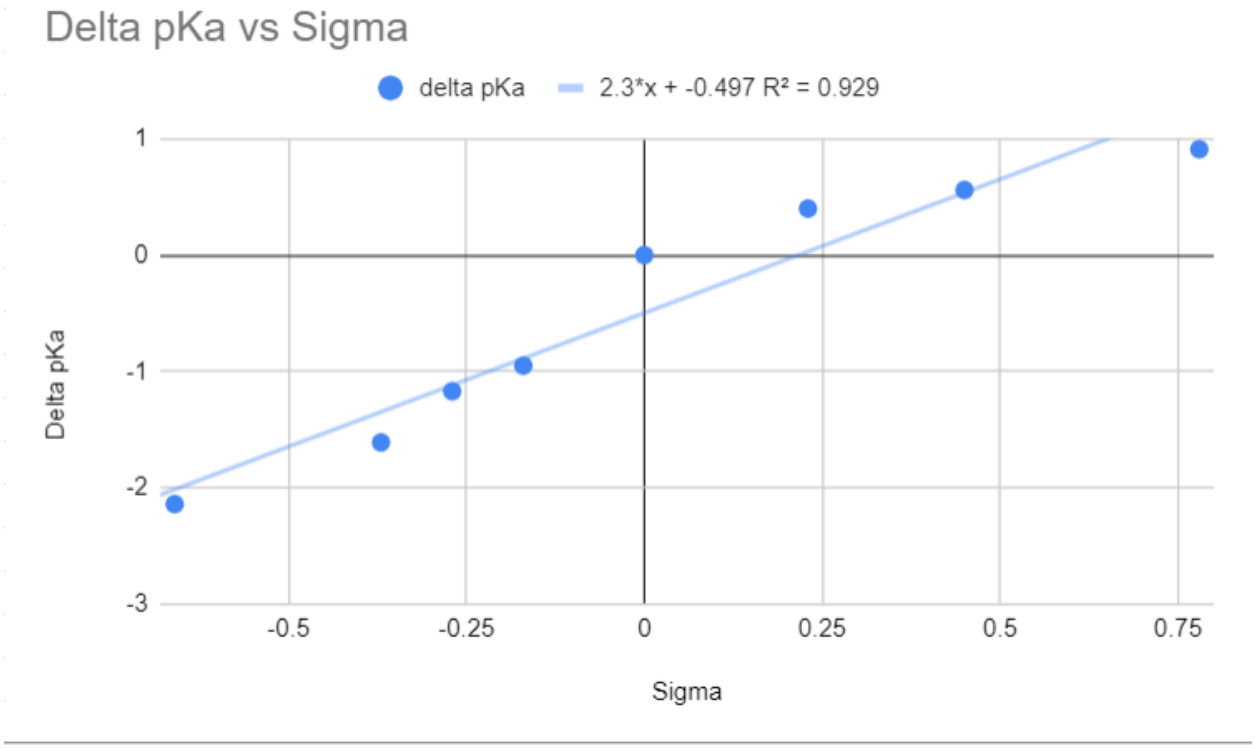
Delta pKa vs Sigma
delta pKa
2.3*x + -0.497 R² = 0.929
1
0
-1
-2
-3
Delta pKa
-0.5
-0.25
0
0.25
0.5
0.75
Sigma