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This past week comprised many "firsts" for me; my first time on an airplane, the first time I have ever been south of the Carolinas, but the biggest first was being at a national conference full of individuals who enjoy the same realms of the scientific world as me and being able to present research that I have done to them in an intellectual environment.

I was a part of the Undergraduate Symposium in a poster session. A poster session is where a group of presenters hang their posters in one room and people may walk around to each person presenting and ask questions about their research. I have been involved in many poster sessions throughout my undergraduate career, but none of this magnitude. There were many presenters, but there were also a fair share of curious minds that would stop to chat. It was a change of pace to talk to others who knew and understood what my research was about. The conversations were sometimes very informative for myself as some would have suggestions for my future work. It was safe to say that I was a little nervous at first to present my work but I am very glad that I had the opportunity to do so. Being able to talk to a vast group of chemists about research that I have done and am interested in doing was an experience like no other.

It was an amazing sight to walk in to the Dallas, TX convention center and see that the entire facility was filled with chemists; that the entire convention center was booked for this event. There were so many things that one could do, it was extremely difficult to decide where I wanted to go. It might have taken me longer to decide what talks to see than actually sitting through talks. The speaker that had intrigued me the most, surprisingly, did not talk much about chemistry but more so on her time being the scientific advisor for the show "Breaking Bad." The gist of the show is that the main character, Walter White, is a high school chemistry teacher who in lieu of a chronic sickness attempts to provide financial stability for his family by "cooking meth." Donna Nelson's, the scientific advisor, job was to sift through the scripts and scenes to make sure the science behind everything was accurate, from his lectures in class to his rants about chemistry to his partner in crime. This was a volunteer position as well, which made this talk even more inspiring. The reason she chose to do this was to bring accurate chemistry into the homes of many Americans. This is a very intuitive means to expand the field of chemistry into the next generation. There were many more speakers at the conference that I could easily talk about just the same, but that would make for a very long article to read.

All in all, I am very lucky to have obtained the opportunity to experience the American Chemical Society's National Conference in Dallas, Texas. I would like to thank the ACS Pittsburgh Division for helping in funding my trip expenses to go the conference. It would not have been possible without it.

Undergraduate Posters 1041

Undergraduate Posters 1042

### Hammett study of the transesterification of para-nitrophenyl benzoates

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**What is a Hammett Study?**  
One of the important tools organic chemists use to predict the reactivity of a functional group is to know the reactivity of the functional group in a given reaction. Hammett studies can provide a quantitative measure of the reactivity of a specific group and allow chemists to predict the reactivity of a new group. Hammett studies can be used to predict the reactivity of a new group and to predict the reactivity of a new group.

**Methods**  
General Transesterification Reaction:  
ArCO2R + Ar'CO2R' <=> ArCO2R' + Ar'CO2R  
The Hammett Plot is defined as:  
 $\log k = \rho \sigma$   
where  $k$  is the rate coefficient for the substituted aromatic ester,  $k_0$  is that for the unsubstituted aromatic compound,  $\rho$  is the substituent constant for the substituent being measured, and  $\sigma$  is the reaction constant.  $\rho$  is Hammett constant. The method is used to obtain a linear relationship between  $\log k$  and  $\sigma$ . The slope of the line is  $\rho$ .

**Synthesis**  
In the synthesis of each substituted benzoate, 1 equivalent of para-nitrophenyl benzoate was allowed to react with the given alcohol at 100 °C in the presence of 1 equivalent of pyridine. Each ester was purified by distillation and then concentrated using rotary evaporation. IR spectra were acquired for each ester. IR spectra were observed at approximately 1700 cm<sup>-1</sup> (ester group) and 1500 cm<sup>-1</sup> (nitro group).

**Results**  
Hammett Plot made from the change of rates with  $\sigma$  for benzoate is slightly greater than 1.

Substituent	$\sigma$	$\log k$
para-nitro	0.78	0.15
meta-nitro	0.72	0.10
para-methoxy	-0.27	-0.15
meta-methoxy	-0.31	-0.20
para-methyl	-0.17	-0.10
meta-methyl	-0.20	-0.15
para-hydroxy	-0.12	-0.05
meta-hydroxy	-0.15	-0.10
para-methyl	-0.17	-0.10
meta-methyl	-0.20	-0.15

**Conclusions**  
The transesterification reaction is sensitive to substituent effects. The Hammett study with varying concentration will allow to see each reaction rate in the context with the results of the Hammett study.

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