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### Understanding the Transition from General to Organic Chemistry

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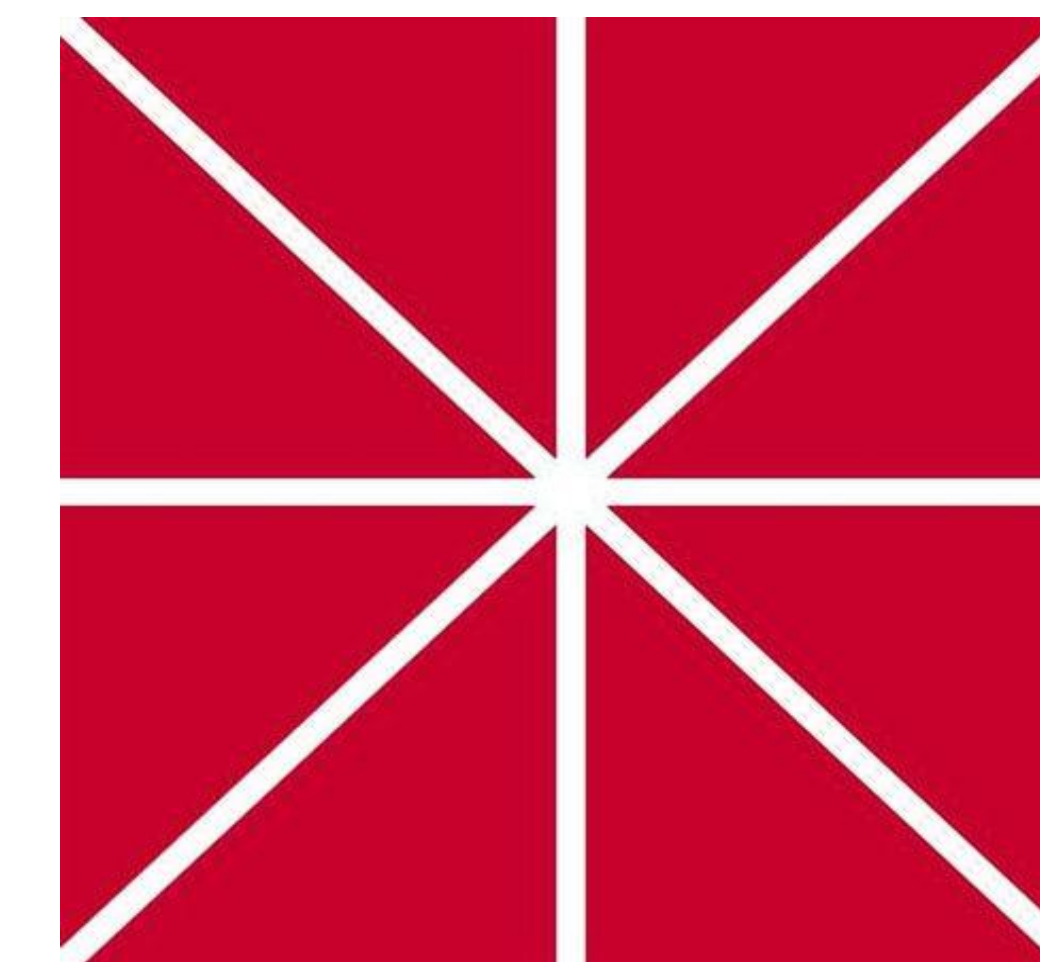
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# Understanding the Transition from General to Organic Chemistry

Hannah Chan  
IRB-21-170

## Introduction

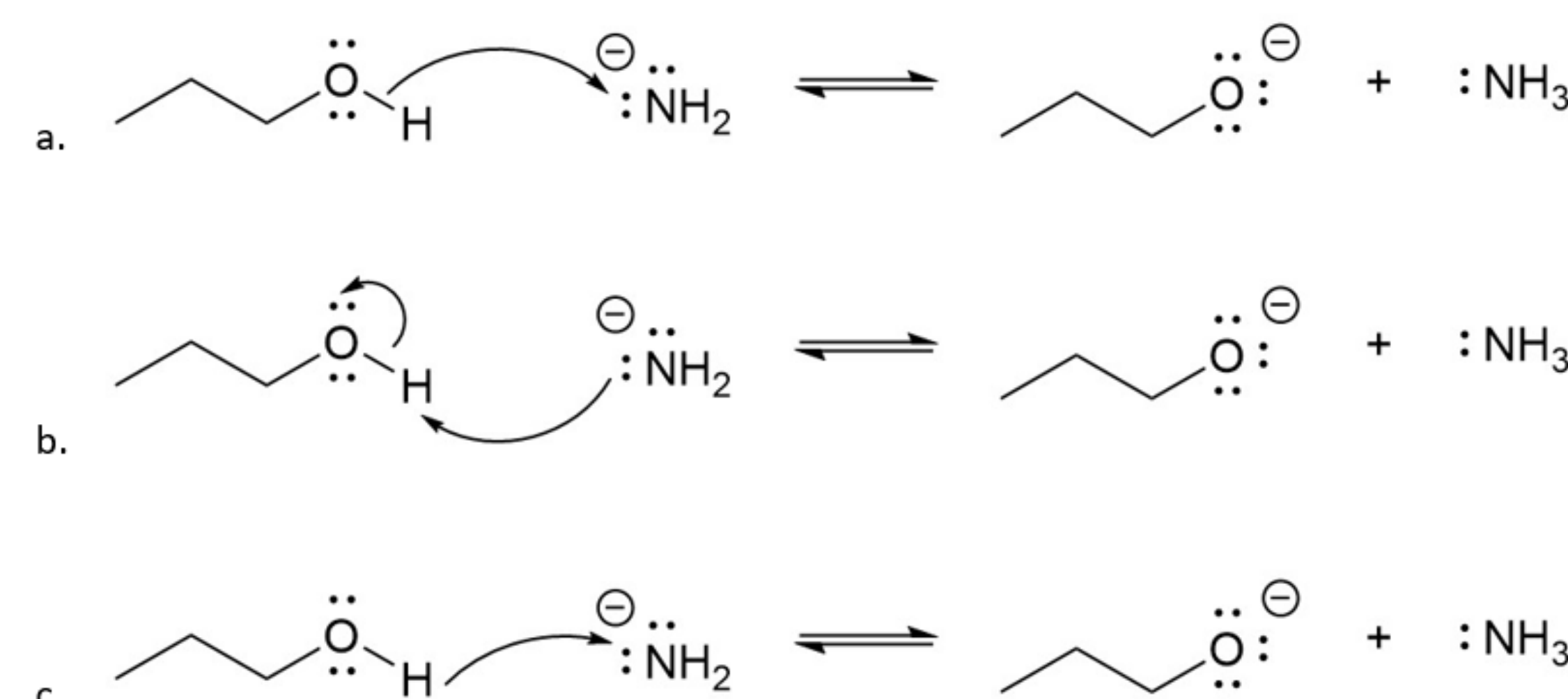
- Chemistry is not only a foundational science course, but is also often associated with high failure rates every semester
- The transition between general and organic chemistry has been noted as the most strenuous
- General chemistry concepts may not be transitioning to organic chemistry courses
- This project aimed to identify whether a modified general chemistry curriculum could assist with the transition into organic chemistry

## Methods

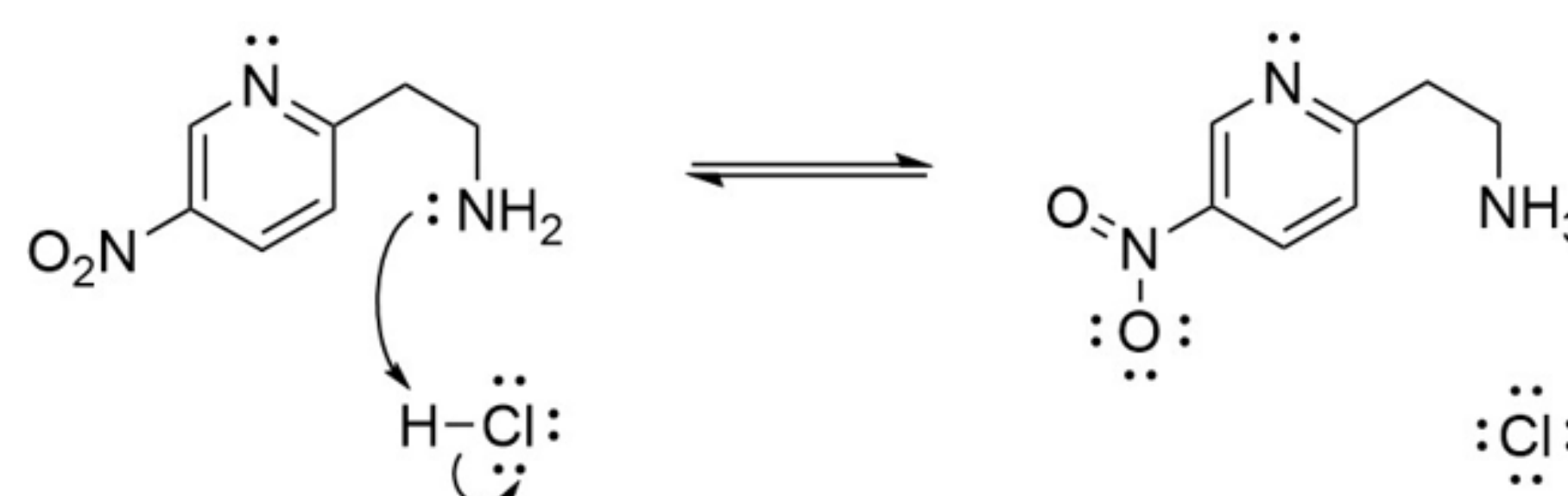
- Two variables were tested (grade outcome and self efficacy) and compared between the two groups (modified general chemistry or traditional general chemistry)
- Grade outcome was probed through four questions (out of 4 pts total) on acid base chemistry in the first exam in organic chemistry
  - A total of 79 students participated: 29 had a modified general chemistry course and 50 were in a traditional general chemistry course
- Self efficacy was assessed using a survey of 6 statements based on a Likert scale (from 1 to 5); out of 30 points max
  - A total of 96 students participated: 31 from the modified general chemistry course and 65 from the traditional general chemistry course

## Acid Base Chemistry Questions:

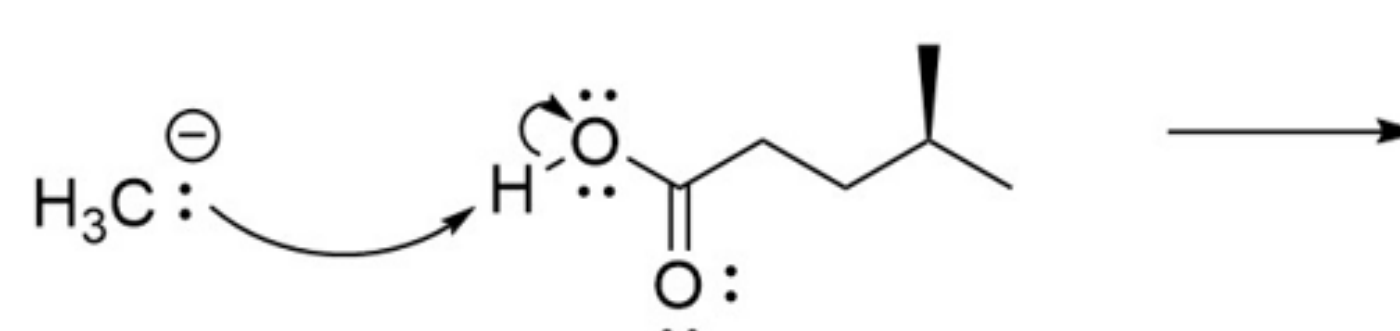
1. Decide which of the following mechanisms is correct



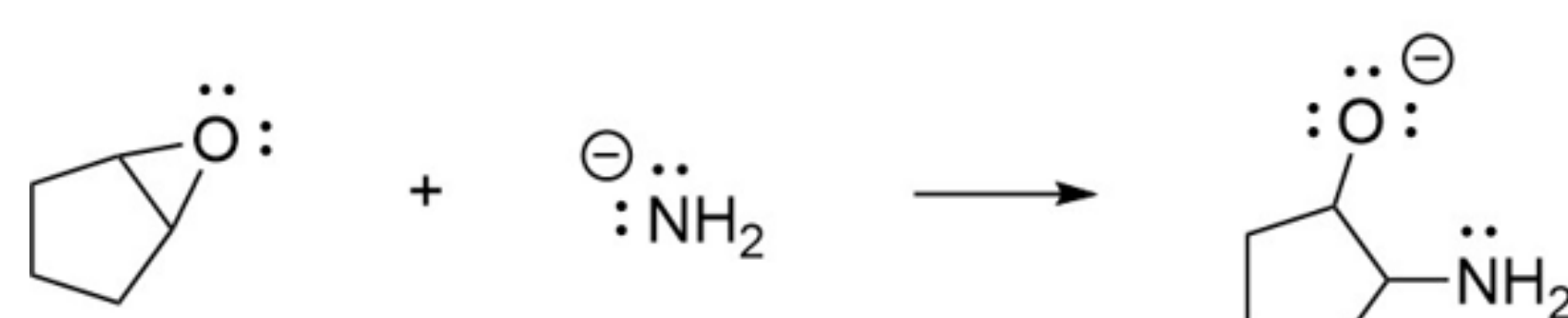
2. Observe the reaction shown below. Add the appropriate formal charges to the final product(s). Assume all atoms will have a full octet.



3. Draw the product(s) of the following reaction.



4. Draw a mechanism (i.e., add the curved arrows) to explain the following reaction.



## Self Efficacy Survey:

- Students were asked to rank their confidence level based on the following (1 being not confident and 5 being very confident)
  - Applying a set of chemistry rules to different elements of the periodic table
  - Tutoring another student in a chemistry course
  - Explaining something that you learnt in this chemistry course to another person
  - Choosing an appropriate formula to solve a chemistry problem
  - Determining the appropriate units for a result determined using a formula
  - Achieving a passing grade in this organic chemistry course

## Results

Table 1. average scores for both grade outcome and self efficacy between the two different general chemistry courses

Grade Outcome			
	N	Mean	Std. Deviation
Modified Gen Chem	29	3.54	0.602
Traditional Gen Chem	50	3.66	0.511
P value = 0.354			
Self Efficacy			
	N	Mean	Std. Deviation
Modified Gen Chem	31	23.71	3.58
Traditional Gen Chem	65	21.72	4.02
P value = 0.021			

- No statistical significance displayed with grade outcome between the two groups
- Modified gen chem students scored higher in self efficacy than traditional gen chem students implying that there could be a correlation between a modified gen chem course and improved self efficacy

## Discussion

- A positive correlation was seen between a modified general chemistry curriculum and self efficacy but the higher self efficacy could have been attributed to other factors not analyzed in this study
- Limitations include small sample size and an uneven number of participants participating in the two variables
- Future research should focus on increasing the sample size and assessing students by grade outcome for more than four questions