

## Student Learning Outcomes for CHEM 12A

*Organic Chemistry*

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### Team Members:

**Team Leader:**

[Ram Subramaniam](#) (8517) in CHEM

**Other members:**

1. [Cinzia Muzzi](#) (x5790) CHEM

**Additional team members/notes about team:**

Ram Subramaniam, Cinzia Muzzi,  
Gary Fisher,

**Additional Notes:**

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### Outcomes:

**Outcome 1 Phase I: Statement**

Predict the product of a chemical reaction.

**Outcome 1 Phase II: Assessment Strategy Used:**

Assessment Quarter: Fall 2010

Assessors: Cinzia Muzzi

Assessment Tools: *No tools assigned.*

Sections being assessed: 01, 02

**Outcome 1 Phase III: Reflect & Enhance**

**Number of people involved in Phase III:** 5

**Changes:**

**Methods:**

Question from the final exam was used to assess this outcome (it is not possible to rewrite the question here due to formatting issues)

**Findings and Conclusions:**

The results are as follows: Number of Responses: 38 Number of Correct: 24 Number of Incorrect: 14 Average % Correct: 63%

**Enhancement (Planned Actions)****Part I:****Part II:**

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**Outcome 2 Phase I: Statement**

Apply principles of thermodynamics, kinetics, and equilibrium to organic reaction systems.

**Outcome 2 Phase II: Assessment Strategy Used:**

Assessment Quarter: Fall 2010

Assessors: Cinzia Muzzi

Assessment Tools: *No tools assigned.*

Sections being assessed: 01, 02

**Outcome 2 Phase III: Reflect & Enhance**

**Number of people involved in Phase III: 5**

**Changes:****Methods:**

The following question from the final exam was used to assess this outcome: Select the rate law for the following reaction  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHBrCH}_3 + \text{OH}^- \rightarrow \text{Br}^- + \text{CH}_3\text{CH}_2\text{CH}_2\text{CHOHCH}_3$

**Findings and Conclusions:**

The results are as follows: Number of Responses: 38 Number of Correct: 28 Number of Incorrect: 10 Average % Correct: 74%

**Enhancement (Planned Actions)****Part I:****Part II:**

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**Outcome 3 Phase I: Statement**

Generate logical stepwise reaction mechanisms.

**Outcome 3 Phase II: Assessment Strategy Used:**

Assessment Quarter: Fall 2010

Assessors: Cinzia Muzzi

Assessment Tools: No tools assigned.

Sections being assessed: 01, 02

### Outcome 3 Phase III: Reflect & Enhance

**Number of people involved in Phase III:** 5

**Changes:**

**Methods:**

The following question from the final exam was used to assess this outcome: Provide a mechanistic explanation for the formation of the observed products in the following reaction.

**Findings and Conclusions:**

The results are as follows: Number of Responses: 38 Total points possible: 10% students obtaining 70% or above (7/10 pts): 29% (11 students) % students obtaining 50% or above (5/10 pts): 24% (9 students) % students obtaining 20% (3/15 pts): 15% (47% students)

**Enhancement (Planned Actions)**

**Part I:**

**Part II:**

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### Outcome 4 Phase I: Statement

Construct molecular structure from spectroscopic data.

### Outcome 4 Phase II: Assessment Strategy Used:

Assessment Quarter: Fall 2010

Assessors: Cinzia Muzzi

Assessment Tools: No tools assigned.

Sections being assessed: 01, 02

### Outcome 4 Phase III: Reflect & Enhance

**Number of people involved in Phase III:** 5

**Changes:**

**Methods:**

The following question from the final exam was used to assess this outcome: An Unknown Compound, L, has the formula  $C_5H_{10}O_2$ . Elucidate the structure of L by scrutinizing its IR,  $^1H$  NMR and  $^{13}C$  NMR spectra shown below.

**Findings and Conclusions:**

The results are as follows: Number of Responses: 38 Total points possible: 20% students obtaining 100% points possible (20/20 pts): 61% (23 students) % students obtaining 70% or above (14/20 pts): 16% (6 students) % students obtaining 69% or below: 23% (9 students)

### **Enhancement (Planned Actions)**

#### **Part I:**

The national success rate in chemistry (based on data from nsf.gov and acs.org) is between 65-70%. Most of the data from the assessment of the outcomes indicate that De Anza College chemistry students are performing well above the national average.

#### **Part II:**

The assessment of outcomes 1 and 3 in this class shows somewhat below average results. However, a closer look at the outcome statements shows that these outcomes pertain to predicting reaction products and reaction mechanisms, concepts that students have been introduced to for the first time in the organic chemistry sequence (12A, B, C). These concepts are further examined in greater detail in the next class in this sequence. We anticipate that student understanding of these concepts will have significantly improved in the next class in this sequence. Assessment data from outcome statements 2 and 4 are particularly impressive. Both of these topics are discussed throughout the quarter and with continuous exposure and practice, students were able to gain a thorough understanding of this material. One major shortcoming of our assessment is that we were unable to obtain any information regarding the student learning in the laboratory, which is a significant component of this class (25-30% of the overall student grade). However, we have proposed to assess the laboratories during our program level assessments.

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