

### COURSE SLO ASSESSMENT REPORT, SCC

Department: Earth, Space and Physical Sciences (Chemistry) Course: Chem 259

Year: 2012 Semester: Fall

1) Outcome to be assessed	A- Apply major concepts of chemical reactivity of organic compounds to solve problems
2) Means of assessment and criteria of success	SLO A will be assessed using a standardized year-long Organic Chemistry exam. We will compare our average to the national average. Success in achieving the SLO means having a score that is the national average or above. For the given version, the year-long organic chemistry exam 2008, the average was <b>39.48</b>
3) Summary of data collected	The data was collected for 15 students Class average was <b>50.7</b> . That average exceeds the national average so in general the class achieved the national average and as a class the SLO was achieved. Only two students (13%) got less than 40 correct answers on the ACS exam. The results for this group were exceptionally good.

Number	incorrect answers	% incorrect	Number	incorrect answers	% incorrect
1	1	7%	36	1	7%
2	6	40%	37	1	7%
3	3	20%	38	5	33%
4	4	27%	39	1	7%
5	0	0%	40	6	40%
6	7	47%	41	2	13%
7	8	53%	42	3	20%
8	7	47%	43	5	33%
9	2	13%	44	1	7%
10	2	13%	45	1	7%
11	1	7%	46	9	60%
12	6	40%	47	4	27%
13	1	7%	48	5	33%
14	4	27%	49	7	47%
15	12	80%	50	6	40%
16	4	27%	51	3	20%
17	2	13%	52	4	27%
18	11	73%	53	1	7%
19	2	13%	54	2	13%
20	10	67%	55	6	40%
21	2	13%	56	6	40%
22	5	33%	57	4	27%
23	2	13%	58	6	40%
24	10	67%	59	5	33%
25	5	33%	60	1	7%
26	1	7%	61	3	20%
27	2	13%	62	7	47%
28	5	33%	63	3	20%
29	2	13%	64	2	13%
30	5	33%	65	3	20%
31	7	47%	66	2	13%
32	7	47%	67	5	33%
33	4	27%	68	9	60%

34	3	20%	69	2	13%
35	2	13%	70	3	20%

4) Analysis of data

Some of these questions more than 50% students missed:

- Question # 15 (Acidic hydrogens)
- Question # 18 (Number of chiral centers)
- Question # 20 (Stereochemistry of Sugars)
- Question # 24 (SN1 vs SN2)
- Question # 46 (amine formation)
- Question # 68 (Polymer)

This group of students did an excellent job and only 6 questions had more than 50% incorrect answers. Last group assessment results showed 25 questions with more than 50% incorrect answers. This is a big improvement but it can be related to the group of the students involved and the small size sample as well.

5) Plan of action/what to do next

Plan to review first semester topics and reactions along the way with introducing new concepts in second semester.

**COURSE SLO ASSESSMENT REPORT, SCC**Department: Earth, Space and Physical Sciences (Chemistry) Course: Chem 259Year: 2012 Semester: Fall

1) Outcome to be assessed	B- Write in scientific terms and interpret patterns of reactivity on the basis of mechanistic reasoning
2) Means of assessment and criteria of success	SLO B will be assessed using a mechanism on the final exam. Success in achieving the SLO means having a 60% on that exam. A rubric was used to evaluate how they can draw a mechanism based on reactivity. The mechanism used was a Friedel-Crafts alkylation of an aromatic ring with a rearrangement of the carbocation.
3) Summary of data collected	One section was assessed with 15 students. A rubric was used to evaluate how they can draw a mechanism based on reactivity. Students were expected to identify the first step in a mechanism, draw arrows correctly and show each step with the correct electron flow and charges and reach the final product. Rearrangement of the carbocation was supposed to be the second step in the mechanism.

	Inaccurate (0 pt)	Developing (1 pt)	Accomplished (2 pts)	Exemplary (3 pts)
Identifies the first step in the mechanism	5 (33%)		5 (33%)	5 (33%)
Draws the product of each step in the mechanism in a logical way				
a. Correct flow of electrons	5 (33%)			10 (67%)
b. Proton transfer steps	5 (33%)			10 (67%)
c. Use of correct charge in acid or base	5 (33%)			10 (67%)
Draws the product of each step in the mechanism in a logical way	5 (33%)			10 (67%)

4) Analysis of data	From these initial results it looks like we have achieved more than 60% of the students drawing a valid complete mechanism (66%). Only 33% of the class wrote a complete accurate mechanism. The other 33% were not able to draw the carbocation rearrangement in its right place in the mechanism and 33% of the class did not write any reasonable steps for the mechanism.
5) Plan of action/what to do next	The sample used for assessment is a very small sample. We will need to accumulate few more sections (over a couple of years) to obtain statistically valid data. Writing a mechanism is always a challenge for the students. Practicing writing mechanisms and also devoting more practice time for drawing mechanism might help the students.



4) Analysis of data	From the given data, 73% of the students were able to correctly determine the name and the structure of the unknown liquid compound but only 46% had the correct B.P. The majority of students were not able to determine the boiling point correctly. Students did not have any difficulty with solubility, halide test, nitro group test, unsaturation test or IR interpretation. The difficulty was sometimes in determining the functional group and the correct tests that goes with that functional group.
5) Plan of action/what to do next	The sample used for assessment is a very small sample. We will need to accumulate few more sections (over a couple of years) to obtain statistically valid data. This group had an experiment on MP and BP determination in the first semester but still BP determination skills needs improvement.