



Chemistry | 2014-2015 Assessment Report

Overview

The spectral analysis of an unknown experiment performed by students in Chemistry 413, Instrumental Analysis was used to assess student performance that addresses Learning Outcome #9. A randomly selected set of reports were assessed in six different areas that measured performance in this Learning Outcome. The rubric was based on a 1 to 5 scale and tuned to have a score of 3 being at the level of expectation for the assessed component of the project.

The average of each of the areas assessed were found to be at the level of expectation. For the exercise assessed the highest score possible in the data collection elements is a 3 as the students were given pure organic compounds to analyze.

Use of Assessment Data

We believe that the program is structured to appropriately to develop student abilities addressed by this learning outcome and propose not remedial action at this time.

Instrumental Analysis Project

Item Assessed						
Learning Outcome #9: Have the ability to operate scientific instruments that provide basic spectroscopic and electrochemical information and to interpret the data obtained.						
Element Assessed			Learning Outcome	Scale	Goal	
Collect an IR Spectrum			9	1 to 5	3	
Collect a Mass Spectrum			9	1 to 5	3	
Collect proton, carbon, COSY, DEPT, and HETCOR NMR Spectra			9	1 to 5	3	
Analyze an IR Spectrum			9	1 to 5	3	
Analyze a Mass Spectrum			9	1 to 5	3	
Analyze proton, carbon, COSY, DEPT, and HETCOR NMR spectra			9	1 to 5	3	
Scoring Rubric for Instrumental Analysis Organic Unknown Analysis						
Score	1. Collect an IR Spectrum	2. Collect a Mass Spectrum	3. Collect proton, carbon, COSY, DEPT, and HETCOR NMR Spectra	4. Analyze an IR Spectrum	5. Analyze a Mass Spectrum	6. Analyze proton, carbon, COSY, DEPT, and HETCOR NMR spectra

1	No spectra obtained	No spectra obtained	No spectra obtained	Can not interpret basic information	Can not interpret basic information	Can not interpret basic information
2	Poor quality spectra was obtained for a simple pure sample	Poor quality spectra was obtained for a simple pure sample	Poor quality spectra was obtained for a simple pure sample	Can interpret the majority of the basic information, but has difficulty in putting the pieces together correctly	Can interpret the majority of the basic information, but has difficulty in putting the pieces together correctly	Can interpret the majority of the basic information, but has difficulty in putting the pieces together correctly
3	Spectra obtained that was appropriate for a simple pure sample	Spectra obtained that was appropriate for a simple pure sample	Spectra obtained that was appropriate for a simple pure sample	Can interpret sufficient amount of information to assist in structure identification	Can interpret sufficient amount of information to assist in structure identification	Can interpret sufficient amount of information to assist in structure identification
4	Average quality data was obtained for a difficult sample	Average quality data was obtained for a difficult sample	Average quality data was obtained for a difficult sample	Can interpret the basic information and some of the advanced information in a spectra	Can interpret the basic information and some of the advanced information in a spectra	Can interpret the basic information and some of the advanced information in a spectra
5	High quality data obtained for a difficult sample	High quality data obtained for a difficult sample	High quality data obtained for a difficult sample	Can interpret the majority of the information present in the spectra to confirm the structure of a compound	Can interpret the majority of the information present in the spectra to confirm the structure of a compound	Can interpret the majority of the information present in the spectra to confirm the structure of a compound

Individual Scores for Instrumental Analysis Spectral Identification 2014 Class

	Obtain IR	Interpret IR	Obtain MS	Interpret MS	Obtain NMR	Interpret NMR
Student 1	3.0	4.0	3.0	4.0	3.0	4.0
Student 2	3.0	2.0	3.0	2.0	3.0	2.0
Student 3	3.0	4.0	3.0	4.0	3.0	4.0
Student 4	3.0	4.0	3.0	4.0	3.0	4.0
Student 5	3.0	2.0	3.0	2.0	3.0	2.0
Student 6	3.0	3.0	3.0	3.0	3.0	3.0
Average	3.0	3.2	3.0	3.2	3.0	3.2