

CHM217: Principles of Chemistry Lab I

Fall 2013

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Office Hours: Office hours are Monday and Tuesday from 12 P.M. to 2 P.M. If you cannot attend the scheduled times, email me to set up an appointment. Expect to wait at least 24 hours before responses to emails.

Description of Course: A laboratory course that demonstrates the application of concepts introduced in Chemistry 211. Corequisite or prerequisite: CHM 211.

Required Materials: CHM 217 lab manual, composition-style lab notebook, goggles, non-programmable calculator (no graphing calculators or cell phones), ink pen

Student Learning Outcomes

Student Learning Outcomes	In Practice	Assessment
Student will learn and follow safety rules in the lab.	-safety training at MUOnline -reading lab manual	-online safety course -midterm and final exams
Students will learn to properly use and care for lab equipment.	-reading lab manual -prelab lecture -lab experiments	-lab reports -online quizzes
Students will learn how to record and communicate procedures and findings.	-reading lab manual -prelab lecture -lab experiments	-lab notebooks -lab reports
Students will apply concepts introduced in CHM211.	-quizzes -homework	-pre- and post-lab questions -midterm and final exams

Course Requirements and Grading: Students should prepare for each class by reading the material that is to be covered, completing the pre-lab questions, and taking the online quiz. Grades will be determined by:

Lab notebook	50	points
Quizzes*	50	points
Lab reports (including pre- and post-lab questions)**	550	points
Midterm	150	points
Final exam	200	points
	1000	TOTAL POINTS

*Quizzes must be completed the night before class.

**The lowest lab report grade of the semester will be dropped.

Grading Scale:

900-1000 points	A
800-899 points	B
700-799 points	C
600-699 points	D
0-599 points	F

Laboratory Schedule:

<u>Date</u>	<u>Exp. No.</u>	<u>Experiment</u>	<u>Lab report/questions due</u>
8/29	1a, H1 and H2	Lab Check-in /Density of Water, Sig Figs and Dimensional Analysis	9/5 (H1, H2)
9/5	1b	Density of Sugar Water and Sodas	9/12 (1a, 1b)
9/12	2	Separating Components of a Mixture	9/19
9/19	3	Determination of % O ₂ in Air	9/26
9/26	4	Reactions	10/3
10/3	5	Determination of Avogadro's Number	10/10
10/10	6	Heat of Reaction and Heat of Solution	10/17
10/17	7	Midterm /Synthesis of an Alum	10/24
10/24	8	Determination of an Empirical Formula	10/31
10/31	9	Titration of Vinegar	11/7
11/7	10	Combustion!	11/14
11/14	11	Molecular Architecture	11/21
11/21	12	Energy in a Peanut	12/5
11/28		No Class, Fall Break	
12/5	Lab Check-out	Final Exam	

Attendance Policy: Attendance is mandatory for the labs and exams. Make-up exams and/or labs will be granted only in cases that are recognized by the University through an excused absence; the policy on excused absences can be found on pp. 123-125 of the 2009-2010 undergraduate catalog: http://www.marshall.edu/catalog/undergraduate/ug_08-09_published.pdf.

Safety Policy: The safety rules for the labs can be found in p. 5 of your CHM 217 lab manual. Closed-toe shoes and pants are required for participation in the laboratory. No midriff-baring tops are allowed. The instructor will send home students who have not dressed appropriately for lab. All injuries, no matter how trivial, must be reported to the instructor immediately.

Policy for Students with Disabilities: Marshall University is committed to equal opportunity in education for all students, including those with physical, learning, and psychological disabilities. University policy states that it is the responsibility of students with disabilities to contact the Office of Disabled Student Services (DSS) in Prichard Hall 117, phone (304) 696-2271 to provide documentation of their disability. Following this, the DSS Coordinator will send a letter to each of the student's instructors outlining the academic accommodation he/she will need to ensure

Density of Water Using Different Measuring Devices

Measuring Device	Trial 1	Trial 2	Trial 3	Average	% error
50mL grad cylinder					3 sig figs
250 ml beaker					3 sig figs
Volumetric pipette					4 sig figs

Your whole table should be on the same page. Insert a page break if you need to.
REMEMBER TO RESIST COPYING A FRIEND'S LAB REPORT!

Measurement of the Density of Aluminum

	Trial 1	Trial 2	Trial 3
Mass (g)			
Final Volume (ml)			
Initial Volume (ml)			
Volume of Metal (ml)			
Density (g/ml)			
% error			
Average Density (g/ml)		Not applicable	Not applicable

(notice units are indicated)

Sample Calculations: *the calculations may be neatly handwritten in **ink** if you do not wish to type them*

Density = m/v $d = 201.1g/200 mL = 1.01 g/mL$ for beaker

Do this sample calculation for the other three measuring devices!

% error = $(\text{observed density} - 1.00)/1.00 \times 100$ (you can take the absolute value if you want to)

% error = $(1.01 - 1.00)/1.00 \times 100 = 1.0\%$

Also, for the second part of the experiment, you would include a sample calculation for density of aluminum metal and the % error calculation for that part of the experiment.

Results and Discussion (In paragraph form, discuss the following)

Discuss the accuracy of your calculated water density value compared to the accepted value. Use percent error results to determine accuracy. Was the % error smaller for the graduated cylinder measurement or for the trials using a beaker? Are beakers well suited for measuring volume accurately? What type of measuring device is the most accurate?

Discuss the density of aluminum that you determined in lab. Compare your experimental density value with the known value. Discuss how you could improve this experiment. How could you collect more accurate data?

Pre-lab Questions: Type or neatly write the answers only.

Show your math and formulas that you use to calculate the answer. **No credit will be given for answers without showing how you obtained that answer.** Write down the mathematical process you went through to obtain the answer, including units, so that I can follow your thought process. If it is a question that requires an explanation, then explain your answer using complete sentences and good grammar.

Post-lab questions: The same rules apply as listed for pre-lab questions.