

## CHEM 1251 AI-Assisted Exam 2 Review

Name \_\_\_\_\_ Exam Form \_\_\_\_\_ Exam 2 Grade \_\_\_\_\_

List of Questions where I lost points: \_\_\_\_\_

Generative AI Source Used For Assignment: \_\_\_\_\_

*\*\*Note: While Charlotte has a premium subscription to Microsoft Copilot, Copilot is very bad at representing math problems. The free version of Chat GPT is recommended. You can make a free Chat GPT account with your @charlotte.edu email address.*

Follow the following steps for at least 6 questions where you lost points on Exam 1. A template and two examples are provided on the following sheet. If you lost points on fewer than 6 questions, then repeat this exercise for every question that you missed, even if the total is less than 6.

1. Locate in your notes or textbook where the question was covered.
  - a. **All questions were covered in class.** If you cannot find the topic in your personal notes, you may consult a friend. If you still cannot find where the topic was covered, then use the textbook. b. "This wasn't covered" = 0 points
  - c. You may also reference in-class problem sets or ALEKS topics in place of class notes.
2. Ask your AI Source the exam question. Read the generative AI response. If the question requires a figure or graph, then you can copy and paste a screenshot of the graphic into the AI prompt.
3. Use your notes/problem sets/textbook to validate the response given by AI. State whether or not your AI source was correct.
  - a. If your AI source was correct, proceed through steps 4-8.
  - b. If your AI source was incorrect, copy or include a screenshot of AI's incorrect response and **write 1-2 complete sentences** that explain why the AI-generated answer was incorrect. Did you make the same mistake as your AI source? **If AI is incorrect, stop at this step.**
4. Identify where you made your mistake. **Write 1-2 complete sentences** (not bullet points) explaining your mistake.
5. Tell your AI source to "Give me a similar question to try *without the answer*". You must specify "*without the answer*" or the AI source will automatically generate the answer.
6. Use the space on your worksheet to test your understanding and attempt the AI generated question.
7. Tell your AI source to "Give me the correct answer".
8. Repeat Steps 5-7 until you get the problem correct.

**Follow the above steps for at least 6 exam questions. Upload the completed assignment as a PDF to Gradescope by 3/10 at 11:59 pm to earn up to 2 in class points.**

**The following page provides a template followed by two examples.**

Version \_\_\_\_\_ Question # \_\_\_\_\_

Locate where this topic was covered during class or in the textbook.

Answer provided by AI (you may copy or provide a screenshot).

Was the answer generated by AI correct? If so, explain your mistake on the exam in 1-2 complete sentences. If AI was not correct, explain AI's mistake.

Prompt your AI source to give you a similar problem *without the answer*. Copy the problem

here. Provide your correct answer (including any shown work) here.

If your answer was not correct, repeat Steps 5-7 until you get the correct answer. Please only put your final correct answer on this sheet.

Version A Question # 7 - **EXAMPLE**

**Locate where this topic was covered during class or in the textbook.**

Chapter 3 Lecture Outline – Pages 7 and 11

**Answer provided by AI (you may copy or provide a screenshot).**

“The orbitals shown in the images represent d-orbitals, as indicated by their characteristic cloverleaf shapes. Figure A represents a  $d_{xy}$  orbital and Figure B represents a  $d_{x^2-y^2}$  orbital.

**Was the answer generated by AI correct? If so, explain your mistake on the exam in 1-2 complete sentences. If AI was not correct, explain AI’s mistake.**

The answer generated by AI was incorrect. In class, we are not responsible for labeling different orientations of d orbitals. Instead, I referenced a similar problem that we did in the Chapter 3 Lecture Handout (page 11). The orbital in Figure A is smaller than the orbital in Figure B, which means that the d-orbital in Figure A has a lower value of n. Of the answer choices, A and B are the only options where the n-value for A is larger than B, and a 2d orbital (B) is not possible.

**Prompt your AI source to give you a similar problem *without the answer*. Copy the problem here.** N/A because AI response was incorrect

**Provide your correct answer (including any shown work) here.**

N/A because AI response was incorrect

If your answer was not correct, repeat Steps 5-7 until you get the correct answer. Please only put your final correct answer on this sheet.

Version   C   Question # 15 -- **EXAMPLE**

**Locate where this topic was covered during class or in the textbook.**

Chapter 5 Lecture Handout (Page 5). There were also similar problems on the Practice Exam and in Chapter 3-5 practice.

**Answer provided by AI (you may copy or provide a screenshot).**

Step 3: Divide by the smallest number of moles

Now divide all the mole amounts by the smallest value to get the simplest whole number ratio:

$$\frac{0.896}{0.448} = 2.0 \quad (\text{for Cu})$$

$$\frac{0.448}{0.448} = 1.0 \quad (\text{for S})$$

$$\frac{1.793}{0.448} = 4.0 \quad (\text{for O})$$

Step 4: Write the empirical formula

The mole ratio of CuS

is 2:1:4, so the empirical formula is:



### Step 1: Assume 100 grams of the compound

If we assume a 100 g sample, the mass of each element corresponds directly to the percentage given:

- Copper (Cu) = 56.55 g
- Sulfur (S) = 14.37 g
- Oxygen (O) = 28.68 g

### Step 2: Convert the masses to moles

To do this, divide each element's mass by its molar mass:

- Molar mass of Cu = 63.55 g/mol
- Molar mass of S = 32.06 g/mol
- Molar mass of O = 16.00 g/mol

Now calculate the moles for each element:

$$\text{Moles of Cu} = \frac{56.55 \text{ g}}{63.55 \text{ g/mol}} = 0.891 \text{ mol}$$

$$\text{Moles of S} = \frac{14.37 \text{ g}}{32.06 \text{ g/mol}} = 0.448 \text{ mol}$$

$$\text{Moles of O} = \frac{28.68 \text{ g}}{16.00 \text{ g/mol}} = 1.793 \text{ mol}$$

Was the answer generated by AI correct? If so, explain your mistake on the exam in 1-2 complete sentences. If AI was not correct, explain AI's mistake.

Yes, according to my notes, AI followed all correct steps and the answer matches the provided key.

Prompt your AI source to give you a similar problem *without the answer*. Copy the problem here.

Determine the empirical formula of a compound that is composed of the following percentages by mass: 40.00% C, 6.67% H, 53.33% O.

Provide your correct answer (including any shown work) here.

Step 1: Assume 100 g  $\square$  40.00 g C, 6.67 g H, 53.33 % O

Step 2: Find # of moles of each  $\square$

Moles C:  $\frac{40.00 \text{ g}}{12.01 \text{ g/mol}} = 3.33$

Moles H:  $\frac{6.67 \text{ g}}{1.01 \text{ g/mol}} = 6.60$

Moles O:  $\frac{53.33 \text{ g}}{16.00 \text{ g/mol}} = 3.33$

3.33

$\frac{6.67 \text{ g}}{1.01 \text{ g/mol}} = 6.60$

Step 3: Divide by smallest # mol to get ratios

C:  $3.33/3.33 = 1$  H:  $6.60/3.33 = 1.98$  O:  $3.33/3.33 = 1$

The empirical formula is  $\text{CH}_2\text{O}$