

Copper Cycle Virtual Lab Expectations and Grading (Due Nov 15, 2021)

Chem 111000-2: Section-33

November 9, 2021

1 General Remarks

This can be handwritten or typed, though typed is easier to read/grade. Or, some portions can be handwritten and some can be typed. Though, you may run out of space if you try and hand write it. If it is handwritten, make sure that it is legible and the scan is readable. Note this assignment is due Monday **Nov 15, 2021** at 5:30 pm.

2 Pre-Lab Questions (20 points)

For question 1, a reaction can only be classified as either a redox, acid-base, or precipitation reaction. It cannot have multiple labels.

For question 2, note that 3.0 M means a 3.0 molar solution, or the a concentration of 3.0 molarity. Note that the units of molarity are moles per litre. So $3.0 \text{ M} = \frac{3.0 \text{ moles}}{1 \text{ Litre}}$.

3 Data and Calculation (10 points)

Each calculation is 5 points. This is very straight forward. Show your work to receive full credit and be careful of significant figures.

4 Equations and Observations (42 points)

Each question is worth 7 points. You might find your pre-lab question 1 especially helpful.

When answering the questions, please be concise. The bulk of the points will come from the more ‘critical thinking’ questions such as ‘What is removed by the washing and decanting at the end of this step?’. Do not write a full paragraph answering the prompts.

5 Discussion (20 points)

Each question is worth 10 points.

You only need to answer the questions, and do not need to create a normal, full-fledged discussion. For question 1 discuss sources of errors/approximations etc that might cause the percentage recovery to be different than 100%.

For question 2 a, you only need a brief explanation of why there is or isn't an excess of NaOH. Part b is straight forward. Do give an explanation (brief mathematical justification) for how it affects the % recovery. Note that single word/sentence responses will yield minimal points. You need to support your answers.

6 After Laboratory Assignment (8 points)

You only need to suggest 1 alternative cycle. Please summarize the cycle in a figure/diagram. Also, please include the relevant chemical equations. You do not need to include detailed procedural steps to receive credit (points will be taken away if they are included)f.