**CHEM 2140: Chem IV Lab**

**Synthesis & Analysis of Cu Coordination Compound — Grading Rubric**

Task Description: Construct a lab report modeled after a scientific journal article detailing your work on the synthesis and analysis of a copper coordination compound. Please refer to the lab manual for more details of the lab report format. Your report will be evaluated using the criteria below. Please note the criteria do not all correspond to specific sections of the report and the format should follow the outline in the manual.

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| --- | --- | --- | --- | --- |
| Criteria | Proficient (3) | Intermediate (2) | Novice (1) | Unacceptable (0) |
| Abstract | Includes a short statement of work performed & methodology employed, includes key quantitative and qualitative results, does not include too much detail, does not begin with “The purpose or this experiment…”  | Most of the important aspects of the work performed and methodology included, missing some key quantitative and/or qualitative results, too much background or experimental detail | Missing several major aspects, simply repeats information from the introduction, too long or short, incudes too much detail, does not include key quantitative and qualitative results, begins with “The purpose of this experiment...” | Not included or unrelated |
| Introduction | Clear statement of the purpose and background of the experiment, key chemistry background or theory described, any chemical reactions of interest included, does not begin with “The purpose or this experiment…” | Missing some key elements of purpose/background, chemistry background incomplete, missing some chemical reactions of interest | Unclear statement of purpose and background, relevant chemistry or theory not described, chemical reactions of interest are not included, begins with “The purpose of this experiment...” | Not included or unrelated |
| Experimental Section | Includes summary of work actually performed written in narrative form that is not copied from the manual, written in past tense, only includes key details of the procedure, specific “parts” not referenced (i.e. A, B, etc.) from the manual | Missing some aspects of the work performed, tense not consistent, includes some details that were not actually performed, some parts copied from the lab manual | Missing many aspects of the work performed, not written in narrative form, not written in the past tense, includes too much or not enough detail, simply a copy of the manual procedure, references specific parts (i.e. A, B, etc.) from the manual | Not included or unrelated |
| Figures & Tables | Appropriate table/figures constructed to report key results, raw data not included, all tables/figures have descriptive captions, all figures/tables referenced in the narrative, all results reported with appropriate units | Tables/figures not complete and some results are missing, some raw data reported in tables/figures, some tables/figures missing captions and/or captions are incomplete, some results missing units | Tables/figures not properly constructed and/or do not contain appropriate results, extensive raw data included, tables/figures do not have captions, tables/figures are not referenced in the narrative, no units included | Not included or unrelated |
| Results | Key results:1. Representative absorption spectrum and standard curve
2. Mass percent Cu determined from the class data including standard deviation
3. Mass percent sulfate determined from the class data including standard deviation
4. Mass percent of ammonia determined from the class data including standard deviation
5. Formula of the copper compound
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| All of the above are included in the report (tables/figures & narrative) and calculated/presented correctly | Some of the above are missing and/or calculated/presented (tables/figures & narrative) incorrectly | Most of the above are missing and/or calculated/presented (tables/figures & narrative) incorrectly | Not included or unrelated |
| Discussion | Narrative discusses important results with references to tables/figures, presented in logical & organized fashion, key findings/claims supported by specific evidence, results compared to literature/known value, specific sources of error are presented that are consistent with experimental results | Narrative missing a discussion of some of the important results, missing some references to key tables/figures, presentation is somewhat disorganized, some key findings/claims not fully supported by evidence, sources of error presented are incomplete and/or not consistent with experimental results | Narrative missing discussion of important results, no references to tables/figures, not presented in a logical & organized fashion, key findings/claims not supported with specific evidence, no comparison with literature/known values, missing specific sources of error | Not included or unrelated |
| Summary/Conclusion Section | Overview of the work presented highlighting key results/claims, no new ideas and/or results introduced that were not previously discussed | Some key points are missing, length a bit too short/long, one/two new ideas introduced | Incomplete overview of the work, key points not highlighted, many new ideas/results are introduced that were not presented previously, much too brief/long | Not included or unrelated |
| References | All sources are cited appropriately in ACS format, all sources cited with in-text citations (numbers) | Most sources are cited appropriately in ACS format, in-text citations not formatted correctly | Sources are not cited correctly in ACS format and/or in-text citations are missing | Not included or unrelated |
| Overall Style | Text is appropriate as a piece of scientific writing, words chosen carefully, clear sentence structure & organization, free of spelling/grammar errors, evidence of editing | Some passages have poor word choice and/or awkward phrasing, narrative is disorganized in some places, tense not appropriate or not in agreement in some places, some spelling/grammar errors | Poorly organized, frequent poor word choice and/or awkward phrasing, many spelling/grammar errors, many instances of verb tenses not agreeing, no evidence of editing | Incorrect format, style, and/or organization |
| Audience | Overall written for an audience of trained chemists | Some instances where to level of detail is not appropriate for an audience of trained chemists | Overall contains too much detail/not enough detail for an audience of trained chemists |  |

**Overriding criterion: If any portion of the report is identified as not being original and/or not done by the student, the paper will receive a zero and academic dishonesty charges will be filed.**