

## Lab report grading rubric for CEM 221/222

### Abstract (5 points)

The *Abstract* should be brief but complete, including a statement of what you were trying to do. All important results should be summarized (for example, relative yield; purity; identification of an unknown.)

### Introduction and Discussion (50 points)

The *Introduction* must discuss the expectations for the experiment. What were the goals? This is also the place to present a summary of the general theory or principle(s) behind the experiment. Brevity is not essential but will be appreciated by the grader!

The *Discussion* must address each result in enough detail to present the theory (if any) behind the finding and to tell whether the desired results were obtained. Evidence obtained by your own experimental work must be used. Spectra obtained should be analyzed in some way, and reactions involved (if any) should be presented and discussed briefly. CEM 222 students **MUST** discuss the mechanism of the reaction.

What goes in the *Introduction* and what goes in the *Discussion* is flexible, and you need not duplicate explanations or background material. **Please do not include a "calculations" section.**

### Conclusion (15 points)

The *Conclusion* must summarize the important results and address each point raised in the introduction *if relevant to the experimental results*. That is, you should not say "the principles of chromatography allowed us to separate the mixture" but if one of the goals was to isolate clove oil, you should say whether you did or did not!

### Experimental (7 points)

The *Experimental* section will *concisely* present the operations actually performed in the laboratory; for guidance, see the laboratory manual and consult issues of ACS journals such as the *Journal of Organic Chemistry* via the OhioLink electronic journal center. Normally this section will include all measurements performed (i.e. starting mass, absolute and relative yield, melting or boiling points, spectral data) during the experiment.

"Cookbooking" (defined in the laboratory manual) will result in a score of **zero** for this section. But we walk a fine line; failure to present (*concisely*) all the important operations will also result in a lower score.

### Yield and appearance of product (8 points)

Yields will be independently calculated by the grader, from the data recorded in your notebook. It will be graded on a 0-5 scale with the largest yield getting 5 points. *Failure to report or properly calculate the yield will result in a grade of zero*. If the grader cannot reproduce your reported yield using data from your notebook pages, you will receive zero points of five for yield.

Appearance of your product will be graded on a 0-3 scale.

These points will be awarded for correct identification of unknowns in those experiments in which unknowns are to be identified.

### Style (10 points)

The report must be well written in ACS standard style with scoring on this scale:

0	2	4	6	8	10
Standard English is trampled on					Concise, well-written and well-edited

Points to consider include not only clarity but spelling, proper use of paragraphs, and so forth. Good writing style will not make up for poor or nonexistent content.

### For each violation:

- ✓ Information obtained elsewhere than the laboratory is not properly referenced: subtract 3 points.
- ✓ Standard ACS format not followed in references: subtract 2 points.
- ✓ Spectra or reaction schemes are not properly referenced in the text: subtract 2 points.
- ✓ Standard report format not followed: subtract 5 points. This includes a cover sheet with *all* of the required items.
- ✓ Inclusion of phrases such as "percent yield" or anything similar: subtract 2 points. See "Calculations for Organic Synthesis" in your manual.

No report will receive a grade lower than zero.

### Notebook pages (5 points)

0. Notebook has not been kept during lab. Notebook pages are illegible (including "too faint to be read") or not present; not all experimental measurements and procedures recorded in notebook; something in the notebook is "crossed out" in such a way that it cannot be read; notebook is not kept in ink; notebook pages are not dated; notebook pages are not signed or initialed.
1. Notebook pages pass inspection for items in (0) but are missing introduction, conclusion, or instrument readouts (TLC plates, GC trace, spectrum or spectra obtained); observations show signs of having been rewritten (e.g. "too neat").
2. Notebook pages pass inspection for items in (0-1) but are not sufficiently clear.
3. Better than (2) but not perfect. All items listed in (0-1) are included.
4. Better than (3) but not perfect. All items listed in (0-1) are included.
5. Notebook pages are easy-to-follow and proper conclusions are drawn. Grader is confident of being able to exactly reproduce what you did in the lab. All items listed in (0-1) are included.

### Scaling

Because not every report will have every item listed above, most reports will be scaled to 100 points. The number of total points for the report will be reported to you when your graded report is returned.