

**CHEM-342 Introduction to Biochemistry**  
**Rubrics for Evaluating Undergraduate Laboratory Experiment**  
**Based on Stokes' Section 11**

**Assignment:** Imagine that you are writing a laboratory manual for an introductory biochemistry course and you have decided that an experiment described by Stokes (the second paragraph of Section 11) illustrates several principles that students should learn about and know. The problem is that Stokes wrote about his work over a century ago. His archaic terminology and descriptions are difficult to understand and thus inappropriate for an introductory laboratory. Carefully reread the second paragraph of Section 11 in Stokes' paper and translate it into a three or four-page (double-spaced) introduction and procedure appropriate for manual in a modern undergraduate laboratory course.

**Grading Rubrics:** This is an undergraduate course where performance below a "C" is unsatisfactory. The guidelines (rubrics) below indicate how the quality of the experiments will be evaluated.

<b>Quality Criterion</b>	<b>Excellent (A/A+)</b>	<b>Very Good (B+/A-)</b>	<b>Good (B-/B)</b>	<b>Acceptable (C+/C)</b>	<b>Inadequate (C- or lower)</b>
<b>Title</b>	Creative or informative title that attracts interest and reflects significance of the experiment	Purpose or significance of the experiment conveyed in the title.	Accurate title that may not convey the main purpose or significance of the experiment.	Title that conveys experiment but includes inaccuracies or misunderstandings	No title or title inappropriate for the experiment described
<b>Introduction</b>	Well-organized, clearly-presented, and interesting. Integrates information from various sources. Provides a solid basis for doing the experiment. Highlights purpose and significance.	Structured and accurate presentation that may have a couple of lapses in clarity but shows conceptual understanding. Interesting without being distracting.	Shows understanding of major conceptual points but does not develop ideas clearly or fully.	Some lapses of understanding. Relationship to the experiment weak. Lean on content and interest.	Difficult to read or rambling presentation. Seems to miss the point or lack understanding.
<b>Procedures</b>	Reflects Stokes' experiment but includes investigative elements that probe and stimulate conceptual understanding. Aware of safety issues.	Displays good understanding of the experiment. Descriptions thorough and easy to understand. Investigative elements weak or missing.	May include lapses which reveal misconceptions but most steps well described.	"Cookbook" listing of steps in procedure with limited need to understand what is being done.	Significant departures from Stokes' procedure which reveal lack of understanding
<b>Transformation</b>	Stokes' archaic terms translated into contemporary language. Modern equipment used where appropriate to replace 19 <sup>th</sup> century equipment. May include useful original or referenced drawings and relevant chemical structures & reactions.	Successful modernization of the terminology and procedures in all but a few points. Illustrations contribute to overall understanding.	Some appreciation for the modern meaning of terms and procedures used by Stokes. Illustrations may be appropriate but have errors.	Misunderstanding of Stokes' meaning occurs in some cases. Illustrations marginally useful.	Modern counterparts of Stokes' archaic terms and equipment missing. Illustration, if any, are superfluous or inappropriate
<b>Educational Value</b>	Questions and assignments encourage breadth and deeper understanding. Information provided selectively to encourage thinking.	Imbedded questions show conceptual understanding of most points. Learning goals fairly evident.	Main conceptual points evident with some lapses of focus or understanding.	Purpose beyond factual and procedural understanding limited.	Questions, when present, seek only factual rather than conceptual understanding
<b>Other issues</b>	Contains distinctive creative elements that enhance the interest and relevance of the exercise. Voice of the author apparent.				Minimal effort. Turned in late. Missed the point of the assignment. Poorly written with numerous grammatical errors