

Book Review from *February 2006/CHEM 13 NEWS*

Essential Experiments for Chemistry

by Duncan Morrison and Darrel Scodellaro, 320 pages, hard-cover, 2005, SMG Lab Books Ltd. ISBN 0-9735707-0-9; and **Teacher's Manual**, 234 pages, paperback, ISBN 0-9735707-1-7

Morrison and Scodellaro's Essential Experiments for Chemistry is simply that — essential. As either a reference or as a class resource, they offer a wide and extensive variety of laboratory activities replete with clear instructions and clarifying diagrams. Not mated to any particular text, this lab manual is able to provide many different, interesting and challenging lab experiences. For the budget conscious, the activities cover the content of both the Grade Eleven and Twelve, University Chemistry courses. In addition, there are some twenty-two lab activities directly correlated to Advanced Placement Chemistry. **In all, it is a multi-faceted book.**

You might well wonder on what basis this manual is being judged. This reviewer has been teaching Chemistry for thirty-four years. In that time I have seen numerous manuals, some associated with a particular text, some stand-alone and some from first-year University courses. I have “cherry picked” some activities in these references in the past, especially for Independent Study Units, I but never felt that any one of them was a complete resource. As a result, over the years I have collected my own set. **Had this reference been available long ago, I would have been spared considerable time.** While many activities are fairly traditional, a large number of them are different, unusual, and exciting to consider. I will definitely use many of these with my Chemistry classes.

The manual begins with a thorough review of safety, measuring and basic skills and provides some introductory activities. These could be used as formative review or tailored to other Science courses.

The next eight sections include twenty-four labs for Grade Eleven University Chemistry. There is ample choice. For example, they offer five labs in the section on Stoichiometry ranging from mole ratios to excess/limiting and percent yield. In the Solution Chemistry section there are five choices ranging from solubility in various solvents to solubility rules and precipitate formation to spectrophotometric analysis. There is also an incredible research lab in the section on the Periodic Table.

The Grade Twelve University course has access to thirty-two labs in Rates of Reaction, Equilibrium, Acids and Bases, Electrochemistry and Organic Chemistry. There is even a section on Chemical Analysis and Synthesis where students can study freezing point depression or determine the molar mass of a volatile liquid by the Dumas method. There is a different and unusual Rate Law determination, an interesting Solubility Product determination as well as solubility application using the Mohr titration, numerous acid base labs including hydrolysis,

buffers, a primary standard analysis and titration curves and excellent redox labs including two redox titrations.

The appendices include information on the use of volumetric apparatus. **The teacher edition provides thorough lab information on safety, hints and suggestions for the novice teacher, as well as required amounts, pre and post lab discussion and full sample calculations.** In addition there is general information on materials that tend to decompose and other useful information. Personally, if there is an area of weakness, it would be that the text is too well appointed. Each lab provides very thorough information including the various charts that should be used. I prefer that senior students decide for themselves the best way to present their information.

In all, Essential Experiments for Chemistry is an excellent laboratory reference. It is an ideal text for both Grades Eleven and Twelve University Chemistry including AP. The activities are significantly better suited, better annotated and more varied than those you will find presented in student textbooks, and could easily be used as a basis for a laboratory course in Chemistry.

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A note from SMG Lab Books:

This CHEM 13 review refers to Chemistry course names that may be different from terms used in your jurisdiction. “Grade Eleven University Chemistry” and “Grade Twelve University Chemistry” are broadly equivalent to General and Honors Chemistry respectively.

In addition, *Essential Experiments for Chemistry* provides labs that meet all of the twenty two topics that are required for Advance Placement Chemistry.

Bold and underlined sections are highlighted by SMG Lab Books.