Experiments in *Discovering Design with Chemistry*

Discovering Design with Chemistry is a new college-prep, high school chemistry course written by Dr. Jay Wile, the author of the first two editions of *Exploring Creation with Chemistry*. One of the most innovative aspects of this new chemistry course is the experimental component. The experiment supplies cost only $70, and they include many items, such as a digital mass scale that is accurate to 0.1 grams, two graduated cylinders, two beakers, and an alcohol burner. With this kit, the student can perform a total of 46 experiments that are scattered throughout the 16 chapters of the course.

There are 13 experiments that measure an important physical quantity. For example, one experiment has the student measure the wavelength of the microwaves used in a microwave oven. In another experiment, the student determines the number of molecules of water incorporated into the crystal of a hydrated compound. The student also measures the amount of sodium bicarbonate in an Alka-Seltzer tablet, the concentration of hydrogen peroxide in a drug store solution, the percent of acetic acid in vinegar, and the energy released in a chemical reaction. In addition, there is a classic percent yield experiment that helps the student learn the importance of experimental error.

The rest of the experiments are designed to illustrate important concepts in the course. For example, the student uses a feather and a lamp to see interference among light waves. A battery and steel wool demonstrate that metals do, indeed, burn. The student gets to build a Galvanic cell, which is the basic unit of a battery. Ice and hot water are used to illustrate the importance of latent heat, and the student uses hydrogen peroxide and yeast to see that a catalyst is not used up during a chemical reaction.

This mixture of quantitative (designed to measure a physical quantity) and qualitative (designed to illustrate a concept) experiments will not only allow the student to learn chemistry more fully, but it will also teach the student good laboratory technique, which will serve him or her well in college. There is simply no other chemistry course designed for the home that gives the student such a rich laboratory experience.

If you cannot purchase the experiment supplies, there are still 27 experiments you can do using just household items. Only three of them are quantitative, but the 27 experiments span 15 of the 16 chapters in the course. This less-expensive option is not recommend for a student who is science-oriented, but it is appropriate for a college-bound, non-science-oriented student.