

Chemistry of Organic Compounds—Preface

Attaching the word *organic* to food and other consumer items has become a mark of quality, to signify that something is natural and unadulterated. Isn't it time to reclaim that connection for organic chemistry as well? Organic chemistry is the chemistry of life! The science of organic chemistry has its roots in the study of natural products—organic compounds isolated from nature. Organic compounds are foods and medicines, soaps and perfumes, preservatives and cosmetics, spices and seasonings, etc. The purpose of *Chemistry of Organic Compounds*, Volume 19 in the Flinn ChemTopic™ Labs series, is to provide high school chemistry teachers with meaningful, easy-to-do laboratory activities that will help students apply the principles of general chemistry to organic compounds. Five experiments and five demonstrations allow students to understand the central role of organic compounds in a wide range of consumer goods and applications. All activities include a discussion of historical perspectives that will make the stories of these fascinating compounds come alive for students.

Introduction to Organic Chemistry

More than nine million organic compounds are known! How are they similar? How are they different? Two introductory worksheets, "Introduction to Functional Groups" and "Naming Organic Compounds," will give students a basic understanding of the structure of organic compounds and will help students recognize relationships among organic compounds. In "Models of Organic Compounds," a guided-inquiry activity, students build organic molecules from the ground up using models and use the reasoning skills of the scientific method to draw structural formulas, determine the general formulas of different classes of compounds, and develop the concept of isomers. There are also several good lead-in demonstrations to illustrate the general properties of organic compounds. Compare and contrast the miscibility and density of organic solvents with water in "Salt-Out the Red, White and Blue," or use the classic "Feeling Blue" demonstration to apply redox principles to organic chemistry.

Natural Products and Consumer Science

The transformation of organic compounds from natural products into consumer products has been a dominant theme in the history of organic chemistry. Having students investigate the preparation and properties of organic

consumer products in the lab helps to reinforce this important theme. In "Making Soap—The Oldest Organic Reaction," students make home-

made bars of soap using natural fats and oils and study the properties of soap. Use the ancient craft of soap-making to show students what chemists really do—chemists use chemicals to make things people use every day! Continue the fascinating trail of discovery from natural products to consumer products with "Preparation of Esters" and "Synthesis of Aspirin." The mini-scale preparations of these organic compounds provide an important safety benefit and save valuable time in the high school lab. The ester lab, which is written as a cooperative class project, highlights the wide variety of fragrant esters in nature and teaches students that organic chemistry makes good "scents"! In "Steam Distillation of Cinnamon," students are introduced to distillation and extraction, common laboratory techniques that have been used for centuries to obtain essential oils and other natural products.

Science in Personal and Social Perspectives

Building connections between the sciences and integrating social and personal perspectives are important goals of science education, and indeed these goals are formally embedded in the National Science Education Standards. The activities in *Chemistry of Organic Compounds* offer an excellent opportunity to help students see chemistry not just in a textbook, but in the world around them. All of the experiments and demonstrations have been optimized to adapt them to the knowledge and skill level of the high school chemistry curriculum. The use of hazardous reagents has been critically evaluated, preparations have been scaled down, and procedures have been reviewed and simplified to make sure they are as safe as possible, yet still produce satisfying outcomes. All of the activities have been thoroughly tested and retested. You know they will work! Use the experiment summaries and concepts on the following pages to locate the concepts you want to teach and to choose experiments and demonstrations that will help you meet your goals.

