



Laboratory Experiments Using Microwave Heating

Nicholas E. Leadbeater, Cynthia B. McGowan

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Allowing many chemical reactions to be completed within minutes, microwave heating has revolutionized preparative chemistry. As a result, this technology has been widely adopted in both academic and industrial laboratories. Integrating microwave-assisted chemistry into undergraduate laboratory courses enables students to perform a broader range of reactions in the allotted lab period. As a result, they can be introduced to chemistry that would otherwise have been inaccessible due to time constraints (for example, the need for an overnight reflux).

Laboratory Experiments Using Microwave Heating provides 22 experiments encompassing organic, inorganic, and analytical chemistry performed using microwave heating as a tool, making them fast and easy to accomplish in a laboratory period. Utilizing the time-saving experiments described in this book also permits students to repeat experiments if necessary or attempt additional self-designed experiments during the lab course.

A number of the chemical transformations use water as a solvent in lieu of classical organic solvents. This contributes to greener, more sustainable teaching strategies for faculty and students, while maintaining high reaction yields. All the experiments have been tested and verified in laboratory classes, and many were even developed by students. Each chapter includes an introduction to the experiment and two protocols—one for use with a smaller monomode microwave unit employing a single reaction vessel and one for use with a larger multimode microwave unit employing a carousel of reaction vessels.

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