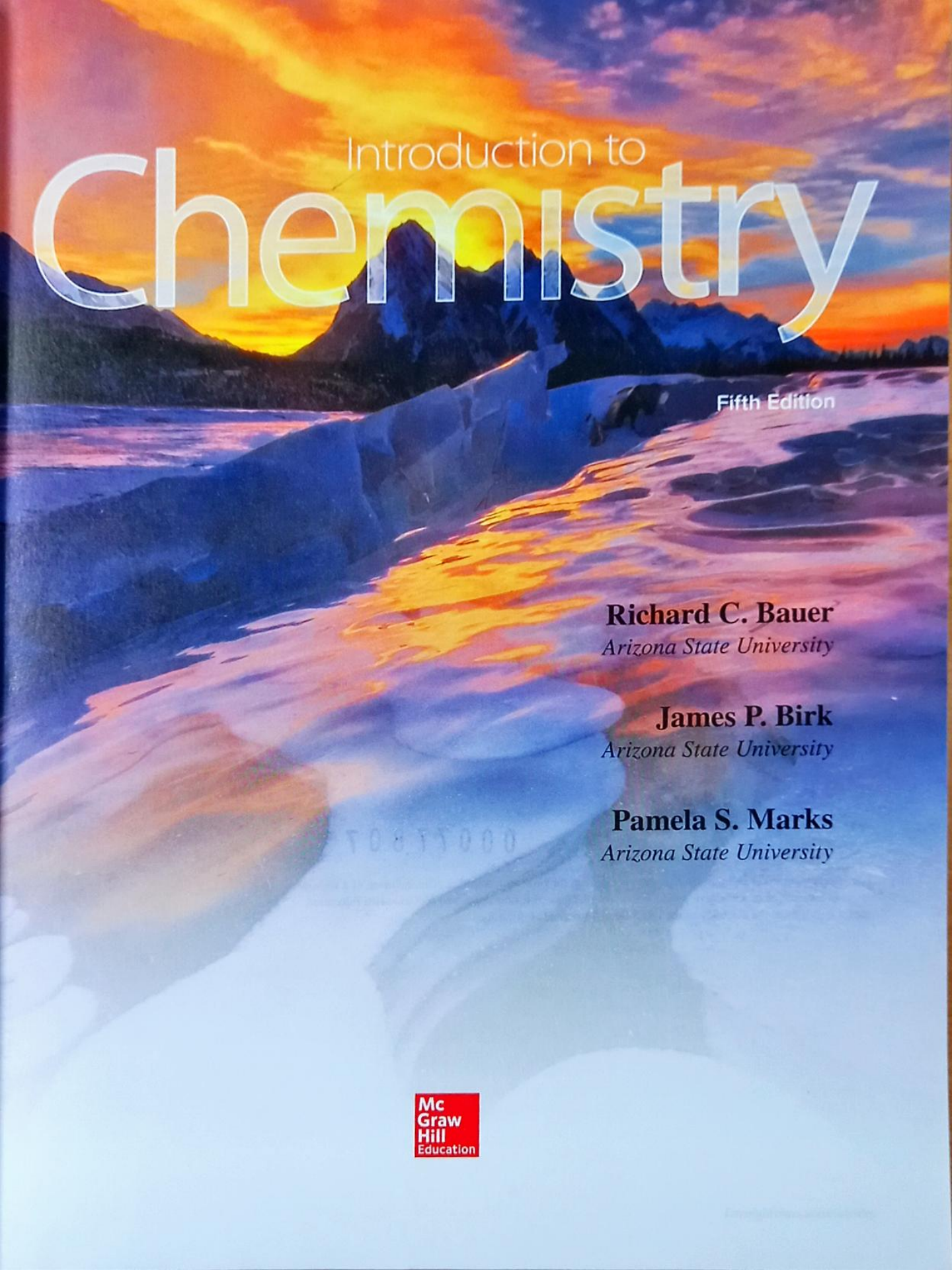# INTRODUCTION TO
Chemistry

Fifth
Edition

McGraw Hill Education

Bauer | Birk | Marks

Introduction to Chemistry

Fifth Edition

Richard C. Bauer
Arizona State University

James P. Birk
Arizona State University

Pamela S. Marks
Arizona State University

McGraw Hill Education

QD
33.2
B32
2019

00077807

The Internet addresses listed in the text were accurate at the time of publication. The inclusion of a website does not indicate an endorsement by the authors or McGraw-Hill Education, and McGraw-Hill Education does not guarantee the accuracy of the information presented at these sites.

Brief Contents

Contents

Appendices A-1

ABOUT THE COVER: Methane is widely used as a fuel in the form of natural gas. Compared to carbon dioxide, methane has 20 times the potential to cause climate warming. In addition to being associated with petroleum deposits, methane can be produced by the bacterial decomposition of organic matter on the bottom of lakes. Abraham Lake in Alberta, Canada is an artificial lake formed in 1972 by the construction of the Bighorn Dam on the North Saskatchewan River. Methane that forms by the decay of plant material on the lake bottom becomes trapped on the bottom as a solid white substance known as methane hydrate. When the lake starts to warm up the methane hydrate melts. The methane is released as a gas, rises, and becomes trapped in the frozen surface. When the ice melts, the flammable methane gas escapes into the atmosphere. This phenomenon happens in numerous bodies of water throughout the Arctic region. Chemists examine such processes and wonder why they occur; study what happens to atoms, molecules, and ions; and probe how energy is involved. In this text, we emphasize how and why phenomena occur, not only in unusual events, such as the formation of frozen gas bubbles, but also in common events that happen in our environment every day.

ALEKS®

Assessment and **LE**arning in **K**nowledge **S**paces® is a web-based, artificially intelligent assessment and learning system. ALEKS uses adaptive questioning to quickly and accurately determine exactly what course content a student knows or doesn't know. ALEKS then instructs students on the topics they are most ready to learn. As a student works through a course, ALEKS periodically reassesses the student to ensure that topics learned are also retained.

connect®

McGraw-Hill Connect® Connect is a digital teaching and learning environment that improves student performance over a variety of critical outcomes; it is easy to use; and it is proven effective. Connect empowers students by continually adapting to deliver precisely what they need, when they need it, and how they need it, so class time is more engaging and effective.

Connect Insight® is an analytics dashboard—now available for both instructors and students—providing at-a-glance information regarding student assignment, assessment, and topical performance, for aggregate or individual results. Connect Insight empowers students and instructors to improve class performance in a way that is efficient and effective.

SMARTBOOK®

SmartBook® SmartBook contains the same content within the print book, but actively tailors that content to the needs of the individual. SmartBook's adaptive technology provides precise, personalized instruction on what the student should do next, guiding the student to master and remember key concepts, targeting gaps in knowledge, and offering customized feedback, thereby driving the student toward comprehension and retention of the subject matter.

LEARNSMART PREP®

LearnSmart® Prep for Chemistry Time is valuable. Make it count! LearnSmart Prep for Chemistry is an adaptive learning tool that prepares students for college-level work in chemistry. It individually identifies the concepts students don't fully understand and provides learning resources to teach essential concepts so each student enters the classroom prepared.