

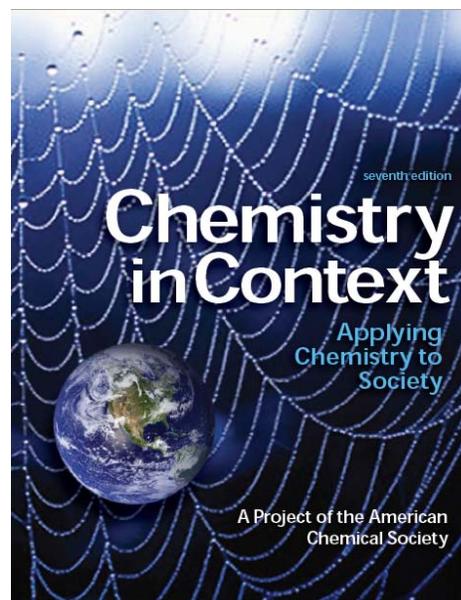
Chemistry in Context

A project of the American Chemical Society

What is New in the 7th Edition ...?

Global sustainability is not just a challenge; rather it is *the* challenge of our century. The 7th edition of *Chemistry in Context* is designed to help students better meet this challenge with its new opening chapter, “**Chemistry for a Sustainable Future.**”

As in previous editions, the 7th edition will continue to weave chemistry into a complex web of societal, political, economic, and ethical issues. The global challenges that we face, including developing new energy sources, mediating the impact of climate change, using water wisely, keeping our air healthy to breathe, and producing food, all require citizens who are willing to engage in learning chemistry *and* apply what they have learned in their communities as well as in the wider world.



Also, as in previous editions, applications of **green chemistry** are woven into each chapter.

In the 7th edition, look for these changes:

Chapter 0: Chemistry for a Sustainable Future is a brand new chapter that introduces sustainability concepts such as *cradle-to-cradle*, *shifting baselines*, *the tragedy of the commons*, *the Triple Bottom Line*, and *ecological footprints*.

Chapter 1: The Air We Breathe now has an expanded section on indoor air quality that includes the green chemistry advances in low VOC paints and coatings.



Chapter 2: Protecting the Ozone Layer benefited from a technical review of its content and now has updates on the connections between CFC replacements and their global warming potential.

Chapter 3: The Chemistry of Global Climate Change was recast in the light of new developments in climate change science. It now clearly outlines the consequences of climate change, introducing the sustainability concept of external costs.

Chapter 4: Energy From Combustion has two new sections on the pros and cons of biofuels, including ethanol, biodiesel, garbage, and biogas. Green chemistry examples include the use of catalysts that allow reactions to run at lower temperatures and a process to convert glycerol to propylene glycol.



Chapter 5: Water for Life continues to feature the unique chemical and physical properties of water, but now connects to the “Water for Life” decade themes of the United Nations. These include the scarcity of fresh water, agriculture and food, water use, and water contamination.

Chapter 6: Neutralizing the Threat of Acid Rain now introduces acids and bases through the timely topic of ocean acidification. The Nitrogen Cycle remains an important part of the chemical principles included in this chapter.

Chapter 7: The Fires of Nuclear Fission again brings the question of the role that nuclear energy will play in our future. The sections on nuclear waste and the uranium fuel cycle have been updated to reflect the changing realities of energy production.



Chapter 8: Energy from Electron Transfer has been updated and recast to better show the match between our energy needs with the available technologies. The sustainability concept of cradle-to-cradle is connected to battery design, pointing out that it is in everybody's best interest to follow the principles of green chemistry as we manufacture batteries and photovoltaic cells.

Chapter 9: The World of Polymers remains much the same but contains new data on recycling.

Chapter 10: Manipulating Molecules and Designing Drugs remains much the same but has updated data on illicit drug use in the U.S.

Chapter 11: Nutrition – Food for Thought has been recast to show that both *what* you eat and *how much* you eat may be two of the most important decisions you make over the course of your life. At stake are both your health and the health of the planet.



Chapter 12: Genetic Engineering and the Molecules of Life received a significant technical revision to better match the advances in the field.

Sustainability concepts in the 7th edition

Tragedy of the commons: Chapters 0, 1, 2, 5 and 6

Triple Bottom Line: Chapters 0, 1, 4, 5, 6, and 7

Cradle-to-cradle: Chapters 0, 7, and 8

External costs: Chapters 0, 3, and 8

Environmental footprint: Chapters 0, 1, 4, 5, 11 and 12

Excerpt from Chapter 0: Chemistry for a Sustainable Future

“With any problem comes the opportunity to find creative solutions. We hope you are asking yourself “What can I do?” and “How can I make a difference in my community?” As you ask questions such as these, remember to include chemistry in your deliberations. Indeed, chemistry is well named the “Central Science.” Today, chemists are at the center of the action when it comes to the sustainable use of resources. Chemists are challenged to use what they know, to do so responsibly, and to proceed with reasonable haste. The same, of course, is true for you. In this book, we will support you as you learn and encourage you to use what you learn to act responsibly and with reasonable haste.”

“... No matter what, the road to better health, better materials, and better energy sources goes through chemistry.”

Bill Carroll, 2006
American Chemical Society
Past President

