

Why Structure and Properties?



Dear Colleague,

In recent years, many chemistry professors, myself among them, have begun teaching their General Chemistry courses with an atoms-first approach. On the surface, this approach may seem like a mere reordering of topics, so that atomic theory and bonding theories come earlier than they do in the traditional approach. A rationale for this reordering is that students should understand the theory and framework behind the chemical “facts” they are learning. For example, in the traditional approach, students learn early that magnesium atoms tend to form ions with a charge of $2+$. However, they don’t understand *why* until much later (when they get to quantum theory). In an atoms-first approach, students learn quantum theory first and are therefore able to understand why magnesium atoms form ions with a charge of $2+$ when they learn this fact. In this way, students see chemistry as a more coherent picture and not just a jumble of disjointed facts.

From my perspective, as an author and a teacher who teaches an atoms-first class, however, the atoms-first movement is more than just a reordering of topics. To me, the atoms-first movement is a result of the growing emphasis in chemistry courses on the two main ideas of chemistry, which are: 1) that matter is particulate, and 2) that the structure of the particles that compose matter determines its properties. In other words, the atoms-first movement is—at its core—an attempt to tell the story of chemistry in a more unified and thematic way. As a result, an atoms-first textbook must be more than a rearrangement of topics: it must tell the story of chemistry through the lens of the particulate model of matter. That is the goal I attempted to accomplish with *Chemistry: Structure and Properties*. Thanks to all of you who made the first edition the best-selling atoms-first book on the market. With this, the second edition, I continue to refine and improve on the approach taken in the first edition. My continuing hope is that students will recognize the power and beauty of the simple ideas that lie at the core of chemistry, and that they learn to apply them to see and understand the world around them in new ways.

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