

HOW WE KNOW: SPECTROSCOPY IN THE FIRST YEAR AND BEYOND

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Chemical educators face the never ending challenge of showing students that the content written in their textbook arises from a rich interplay of experimentation, imagination and a desire to understand and impact the world. We have found that asking three simple questions – What do we know, How do we know it, Why do we care – is an effective strategy to guide the content and pedagogy within our chemistry classes. Of these three questions What we know is the most thoroughly covered and with the growing use of rich context teaching, the Why we care is becoming more central to our chemistry teaching. How are we doing on telling students How we know?

Spectroscopy is at the core of our ability to answer questions about how we know things about the molecular world. Yet the teaching of spectroscopy is not a central part of student's early chemistry learning, often being left to the later stages of degrees and courses. For example, a brief look at common North American general chemistry text books reveals almost no discussion of spectroscopic techniques and their centrality to understanding chemistry.

In this talk I will discuss efforts to bring spectroscopy into the first year course and some of the repercussions this has for the whole chemistry undergraduate curriculum. The goal is to make students better aware of where the ideas in chemistry arise from, the strengths and weaknesses of spectroscopic experiments, and how our models of the molecular world are built on rigorous experimentation.