Assessing student habits related to representing chemistry at the particulate level

Abstract

Because student learning in chemistry ultimately includes developing facility with concepts at both the macroscopic and particulate (atomic/molecular) level it is important to consider how students negotiate learning that bridges these levels. Chemists use many different representations and mental models to think about the molecular scale underpinnings of chemicals. The development of multiple models by students, however, is a sometimes messy and often error-prone process that can have an important influence not only on how students think about atoms and molecules but also on how they perceive chemical processes as a whole. This talk will emphasize ways in which we can observe student tendencies related to atomic and molecular representation in chemistry education research projects and how these observations might be scaled up to be useful for larger scale assessment of student learning. Data from studies related to representation use can also be helpful for guiding decision making about teaching practices in chemistry even when the analysis method may not be readily adapted for use in large general chemistry classrooms.