

Do We Really Need to Understand This?

In order for students to work on the limited number of instruments, six lab experiments, such as freezing point depression of electrolyte solutions and partial molar volume, operate simultaneously each week in Peter's P-Chem lab. Students rotate through them in a different order. These experiments were new and so difficult for Peter that he had no idea what to do when he read the directions the first time. "If I can't do understand these experiments, how can the students understand them and get anything out of them?," he thought.

One day Smitty and Mike, two of his students, had an unexpected problem when they were determining the vapor pressure of a pure liquid. They added a lot of ice into the water bath to cool the cyclohexane. The temperature dropped so rapidly that they couldn't make the liquid in the U-tube equal. As a result they saw many bubbles going to the isoteniscope. That meant the pressure they recorded wasn't the vapor pressure of the cyclohexane because it included the pressure of air. But they went ahead. Peter saw it and told them to stop the experiment.

"Why? Does it matter?" Mike asked. With Peter's full explanation, they stopped the experiment reluctantly. Afterwards, Peter asked Smitty, "Did you prepare for this experiment?" "Of course," he responded. "I read the directions carefully, but I have no idea about what it means. I just want to know how to do it correctly and fast." Peter volunteered, "This is a required lab for me, but I'll never need this except to get through this course. My dad said he never had to use what he had in P-Chem. You're a chemistry grad student and I'll bet this is stuff you'll never use except to teach this lab. Right?"

In general terms, what are the purposes of the experiment being performed?

Does Peter's action show that he understands the purposes of the lab?