A MICROFUGE TUBE DIODE ARRAY SPECTROPHOTOMETER FOR CHEMISTRY TEACHING LABORATORIES

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ABSTRACT

We present the development of a fuge tube diode array spectrometer system. A diode array spectrometer can rapidly collect spectra. However, standard measurement cells require reactions to take place in a separate vessel and be transferred to a cuvette for analysis. A micro fuge tube is a small, capped vial that can be centrifuged. Combining the fuge tube into the diode array spectrometer design allows for a single container to be used for reaction, centrifugation and spectra collection. The new design design uses a 1.5- mL micro-fuge tube for a sample cell in an Ocean Optics diode array spectrometer. This design allows for the study of a multitude of chemical systems which were previously difficult. Initial experiments have demonstrated fuge tubes can be used reliably as a sample cell. The fuge tube permits single container experiments where precipitates can be spun out of solution and absorbance measurements performed on the resulting solutions. This presentation will provide a description of the instrumental design, the validation data, and a proposed set of teaching experiments. We believe that this new instrument configuration, which combines many of the current trends in laboratory equipment with a modern sample container, will allow the incorporation of many novel and modern experiments into the undergraduate laboratory experience.