An Easily Constructed Dual Chamber Microcuvette for Ultraviolet–Visible Spectrophotometry of Aqueous Solutions

An inexpensive but very useful dual chamber microcuvette module has been constructed by cutting slits in a methacrylate block (Plexiglas) and gluing on small quartz windows with epoxy glue. The Plexiglas body size and slit location is chosen for the available Coleman Autoset spectrophotometer, and thus the entire cell body becomes the adapter. The dual chamber microcuvette described has provided accurate readings from 200-μl. samples in both static and kinetic (enzymic) assays with visible and with ultraviolet light.

Enzymatic oxidation is critically important in the toxicant field. Toxicant oxidation is closely tied to the study of microsomal oxidations, although enzymes from other parts of the cell may also be important. Density gradient centrifuging and spectrophotometric analysis are often used to localize such microsomal oxidizing systems. A large volume of the fraction commonly is necessary prior to spectrophotometric measurement, but in many instances the desired volume is not available. Therefore, we constructed a dual chamber microcuvette that could utilize volumes of less than 0.5 ml.

The cell body shown in Figures 1 and 2 was constructed from a $^3/_8 \times ^7/_8 \times 1^9/_{16}$-inch methacrylate (Plexiglas) block (Plastic Sales and Manufacturing Co., Kansas City, Mo.) by the use of a Craftsman (Sears) No. 9-32534 blade and radial saw arm. Slits $^9/_{16}$-inch deep were cut in the Plexiglas block to produce cell volumes of approximately 200 μl. each. Slits and configuration of the Plexiglas block can be adjusted to the particular spectrophotometer available. With the entire cell body becoming an adapter, the sample and reference chamber will have identical path lengths. The handling of the module is facilitated by its compact design (Figures 1 and 2). We glued small quartz windows from broken Beckman 1-cm. cells in place with "5 minute epoxy," carefully applying ample glue but not allowing it to spread into the window area. An equally suitable and inexpensive window may be constructed from quartz microscope slides (Esco Products, Oak Ridge, N. J.). The microcuvette and the base were especially designed to be used in a Coleman Autoset spectrophotometer (Figure 2).

Sliding of module between grooved members (*B*) is facilitated by grasping curved member (*A*) incorporated into the base of the module. The light beam @560 mμ was centered in reference and sample compartments by abutment against retaining block screws (*C*). The original Coleman 30-108 transfer plate was replaced by a modified base constructed from $^1/_8$-inch Masonite. As the Coleman Autoset spectrophotometer employs a focused beam which imaged a narrow slit, the center of the cell slit was so aligned to be at this focal point.

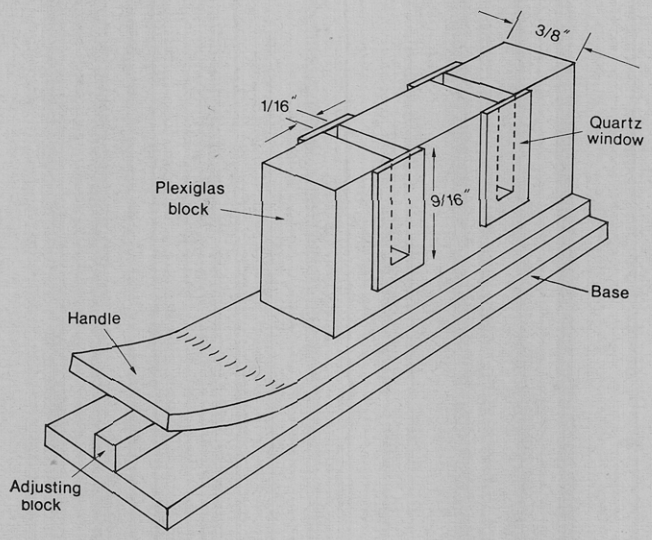

Figure 1. General features of a dual chamber microcuvette

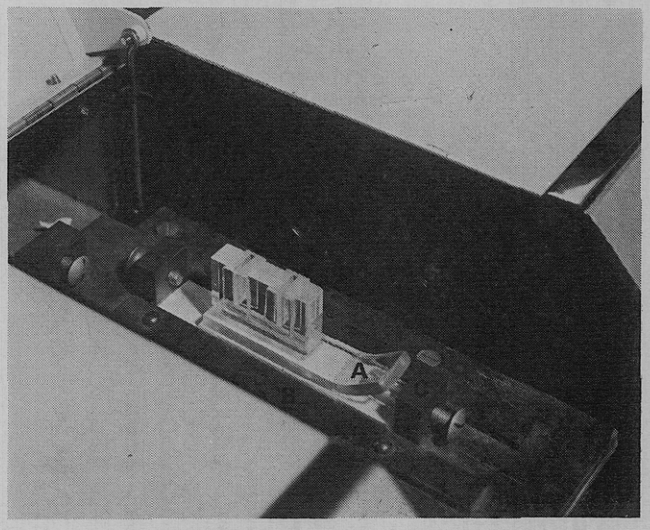

Figure 2. Application of a dual chamber microcuvette adapted to Coleman Autoset spectrophotometer

The nature of the Plexiglas permits the use of aqueous systems only, which does not seriously restrict most enzyme work. Other solvent resistant materials having the same module configuration could be used.

We obtained accurate readings in enzymic assays, with visible and ultraviolet light using the dual chamber microcuvette and 200-μl. samples. Thus, the scale of some standard assays established for standard 1-cm. cuvettes has been reduced by at least $^1/_{10}$ of the original scale. This microcuvette is inexpensive compared to commercially available ones which need adapters for use in standard spectrophotometers. Total construction cost was less than $5.00.

ACKNOWLEDGMENT

The authors thank B. A. Cunningham, Department of Biochemistry, for his assistance.

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Received for review November 21, 1969. Accepted January 2, 1970. Contribution No. 1009, Department of Entomology, Kansas Agricultural Experiment Station, Manhattan, Kansas, U. S. A. Research supported in part by Regional Research Projects NCM-37 and NC-85, and Kansas projects 687 and 481.

Correction

DETERMINATION OF CARBOFURAN AND ITS CARBAMATE METABOLITE RESIDUES IN CORN USING A NITROGEN-SPECIFIC GAS CHROMATOGRAPHIC DETECTOR

In this article by R. F. Cook, R. P. Stanovick, and C. C. Cassil, J. AGR. FOOD CHEM. **17,** 277 (1969), a phrase has been omitted. Page 278, Column 2, paragraph 5, beginning with line 9 should read: Add 80 ml of distilled methylene chloride to the column. Pour in 5 g of silica gel. Pack the column using suction...