A MONOCHROMATIC LIGHT SOURCE FOR THE PETROGRAPHIC MICROSCOPE

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The writers have devised a low cost, compact, portable source of monochromatic light using 110 volt alternating current, by which it is possible to determine indices of refraction completely accurate to the third decimal place with liquids of high dispersion. Fairly reliable determinations may be made to the fourth decimal place.

The source of light consists essentially of a small transformer, a specially designed mercury vapor lamp on the Geissler tube principle, and a set of glass filters. The transformer is the type commonly used in neon display signs, converting 110 volt alternating current to approximately 2500 volts.

The lamp (Fig. 1) is a coil of capillary pyrex glass tubing with a bore of one mm., which is welded to electrode chambers about seven mm. in diameter.[2] The coil is 50 mm. in diameter and is coiled simply to increase the amount of light available to the microscope. The electrodes are tubular and are connected to copper leads which in turn are connected directly to the transformer (Fig. 2). Large electrode chambers not only assure adequate gas for the capillary tubing, but provide for electrodes having large surface area for proper discharge. A small amount of argon gas is present with the mercury in the tube to act as a carrier gas, but the brilliant mercury spectrum masks out the argon lines.

The filters are two-inch polished glass squares produced by Corning Glass Works. A combination of three filters (numbers 3486, 4303, and 5120) isolates the green line of 5460 Å.

The transformer, lamp, and filters are compactly arranged in a box with a lid, and with an aperture on one end slightly smaller than the filters (Fig. 2). The lamp is fastened to an asbestos-covered block of wood and the filters are supported in a metal bracket containing a spring, so that they may be easily removed yet fit closely over the aperture when in place. The box is $11'' \times 3'' \times 4''$ in size.

In making index of refraction determinations, the light may be used generally with as high as 400 magnifications, the brilliance of the image depending on the nature of the specimens and liquids. The 5460 Å line is close enough to the sodium reference line of 5890 Å. for routine use. For extremely accurate work, the light should be used in a dark room to eliminate extraneous light.

[1] Published by permission of the Director, United States Geological Survey, Washington, D. C.

[2] The lamp was made for the writers at the General Physical Laboratory, 509 Fifth Avenue, New York 17, New York.

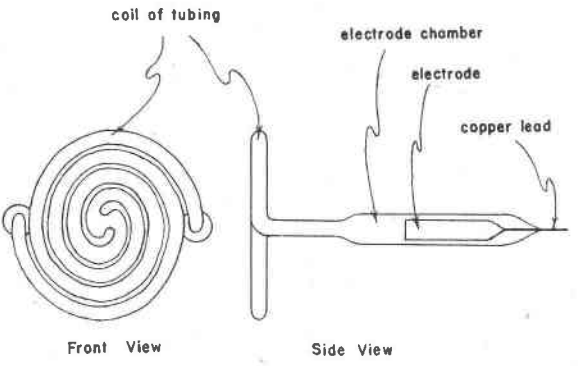

FIG. 1. Front and side views of mercury lamp.

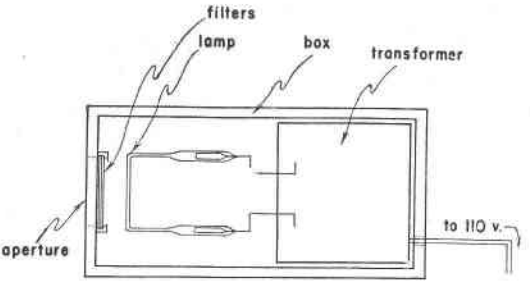

FIG. 2. Diagram of complete monochromatic light unit.

METHOD FOR POLISHING DIAMOND-DRILL CORE SPECIMENS

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Petrographic laboratories and museums occasionally find it necessary to polish large diamond-drill core specimens of rocks for study or display purposes. The writer is not familiar with any published procedure for accomplishing this and therefore considers that the method evolved at this laboratory may be of value to others confronted by the same problem.

Recently, a diamond-drill core, $2\frac{1}{8}$ inches in diameter and about four feet long, of a dark-colored, dolomitic limestone, containing clay seams and cut by numerous joint fissures healed with white coarsely crystalline dolomite, was received at this laboratory. Since this core exhibits numerous features in connection with the investigation of the suitability of rocks proposed for use as aggregates in concrete, it was decided that it be polished and retained as a display specimen in our museum.

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