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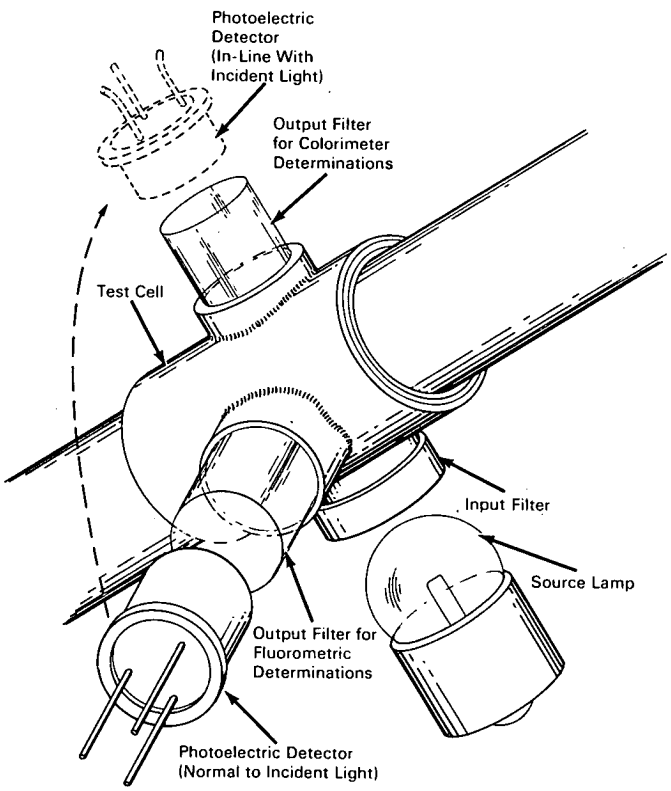
NASA TECH BRIEF

Optimetric System Facilitates Colorimetric and Fluorometric Measurements



A compact, unitary optimetric system has been devised for colorimetric, fluorometric, and spectral absorption measurements. There are many known systems that are designed specifically for making colorimetric measurements or specifically for fluorometric measurements. None of these systems is as simple or compact as the unitary system, which employs a single device for colorimetric, fluorometric, and absorption measurements, as required. In conjunction with this system, a simple technique has been developed for fabricating small lenses.

The basic element of the unitary system is a test cell represented in the illustration. The sample to be subjected to measurement is placed in the cell. For a fluorometric determination, the detector is positioned normal to the incident light from the source. For colorimetric determinations (spectral absorption or transmission measurements), the detector is positioned in

(continued overleaf)

line with the incident light through the sample under test. In this test cell design, the filter elements with lenses are fused into the wall of the cell.

Small lenses can be used as separate elements in an alternative design. A simple technique for making a lens is as follows: A platinum wire is formed into a ring having a diameter corresponding to the diameter of the required lens. A glob of fused glass is placed in the ring which is held perfectly horizontally while the glass is allowed to cool slowly to the "solid" state. The surface shape of the lens (lens formula) may be calculated very accurately, as the surface tension of the fused glass (which produces a meniscus) is constant over the entire area of contact with the platinum ring. Small lenses of this character cannot be ground to the degree of accuracy achieved by this technique. The molten glass can be mixed with appropriate coloring materials to produce built-in lens-filter combinations. A flat ring of platinum or gold is used when an appreciable thickness or lens barrel is desired. The surface shapes of the lenses can be controlled by rolling the ring or sleeve during cooling of the fused glass. Accurate control of the focal length of the lens may be accomplished by using a predetermined weight of the glass applied to the ring or sleeve.

Patent status:

Title to this invention has been waived under the provisions of the National Aeronautics and Space Act [42 U.S.C. 2457 (f)], to the California Institute Research Foundation, 1201 E. California Boulevard, Pasadena, California 91109.

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