Device for evaporation of solvent from small samples

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SUMMARY A device for the simultaneous evaporation of six samples under separately controlled streams of nitrogen is described.

KEY WORDS microevaporation · manifold device

THERE ARE MANY OCCASIONS in lipid and other analyses when solvents need to be removed from a sample. It is desirable when working with lipids to evaporate in the absence of oxygen. For small samples a stream of nitrogen directed at the top of the liquid will effectively evaporate most lipid solvents. If maximum efficiency is to be achieved, the nitrogen stream must be positioned accurately and its velocity must be capable of precise adjustment. For practical reasons it is important to be able to handle several samples simultaneously. A device is described here which meets the above criteria, allows evaporation from many different types of laboratory vessels, and is easily constructed.

The device (Fig. 1) consists of a manifold (2.54 cm diameter copper tubing) with six needle valves (Imperial-Eastman Corporation, Chicago, Ill., No. 310-C) mounted on top. Clear plastic tubing (Tygon) connects the valves to the elongated stainless steel nozzles (laboratory cannula, 14 gauge, 4 inch, Becton-Dickinson & Co., Rutherford, N.J.). The ends of the manifold are closed off by a brass plate which extends down to support

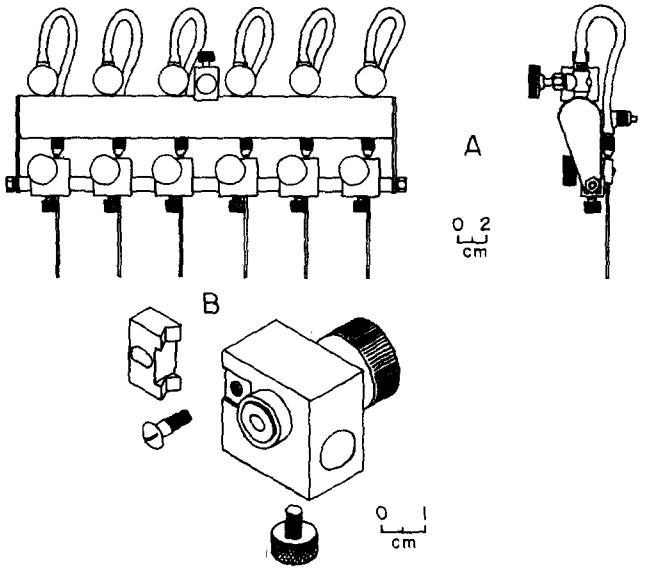

FIG. 1. The small sample evaporator showing the front and side view (A) and a more detailed view of the nozzle-directing component (B).

a 9.5 mm rod in a horizontal position; the rod in turn supports six nozzle-directing components (Fig. 1B). These components were machined from brass and measure 2.54 × 2.54 × 1.59 cm. A small wheel, with a ring of Tygon (cut from 1.27 cm, 1.6 mm walled tubing) slipped over it, is placed next to a brass V-grooved friction block (Fig. 1B). The operator can position the nozzle caught between the wheel and the friction block by turning the knob attached to the wheel. The nozzles can be spaced along the horizontal bar and moved both vertically and towards the horizontal plane so that a series of samples in vessels of a variety of sizes and shapes can be evaporated simultaneously. During the evapora-

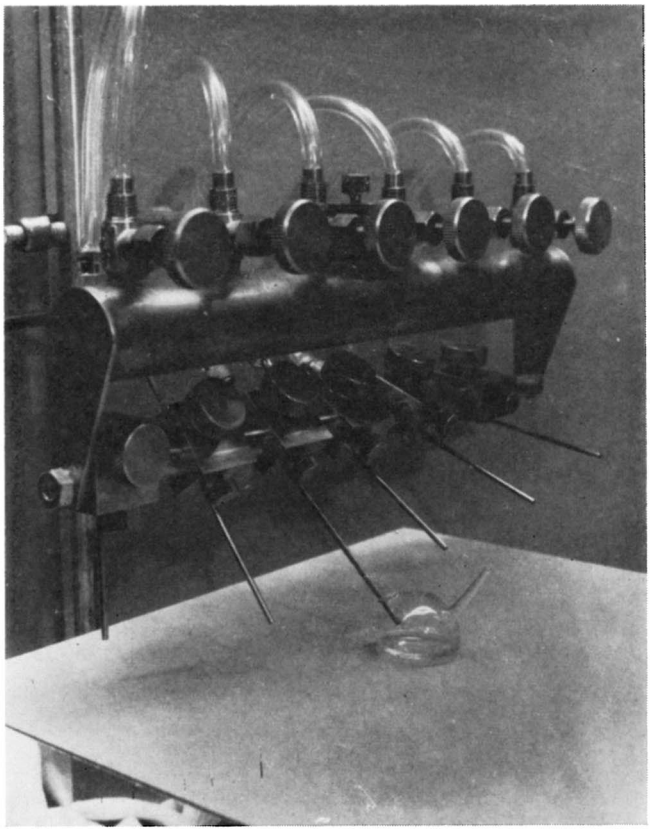

FIG. 2. Photograph of the small sample evaporator illustrating its flexibility and showing the evaporation of solvent from a small weighing flask.

tion the nitrogen velocity and the vertical position of the nozzles can be individually regulated. The flexibility of this device is useful when solvent is evaporated from an unusual flask such as the special evaporating and weighing flask in Fig. 2. The microevaporation and weighing flask was designed to contain small samples of lipids while the solvents were being evaporated under a stream of nitrogen, even when sample "creeping," which was a particular problem with our samples, occurred (1).

The evaporating device can be attached with 1.3 cm ($^1/_2$ inch) rods to any standard laboratory support system or simple ring stand, and the entire device can, with suitable laboratory clamps, be moved up or down.

This evaporator has proven to be a convenient and effective apparatus for removing solvents from small samples of lipids in a variety of vessels. The flexibility and ease of positioning the nitrogen stream and the convenient means of adjusting its velocity are its chief advantages.

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REFERENCE

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