

A Method for Rapidly Transferring a Substance on Paper to the Origin of a Chromatogram

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A simplified method has been devised for eluting a substance separated by means of paper chromatography and for transferring it to the origin of another chromatogram (1). This technique is novel only in its simplicity and apparatus requirements. Methods for rapid elution (2) and transfer to the origin of a chromatogram are in use, but they require special apparatus; on the other hand, methods requiring standard laboratory apparatus (3) are slow and time consuming for the experimenter.

A schematic presentation of the apparatus used is shown in Fig. 1. The apparatus consists of a hair dryer that is directed toward the origin of the chromatogram, two flat plates with a 1-in. central, circular cut, and a beaker. The manner in which the spots are cut for elution and transfer to the origins of other chromatograms is shown in Fig. 2.

The cutout is attached to another strip of filter paper by means of a basket weave or by lacing with platinum wire. The attachment by means of platinum wire is quicker, but it does not establish the paper-to-paper contact as well as the basket weave. The paper strip is then folded, and the sides are stapled together, thus forming what may be called a transfer wick, which is self-supporting in a beaker. The transfer wick is cut so that the pointed tip just makes contact at the origin. Its length can be adjusted if the basket weave is used. If greater stability of the transfer wick is desired, a paper strip approximately one-half the height of the beaker is cut and the ends are stapled together, forming a ring slightly smaller than the beaker. The paper with the substance to be transferred is attached to this ring by the basket-weave or platinum-wire method.

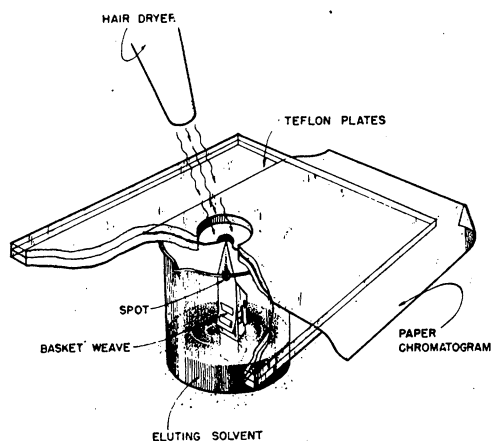


Fig. 1. Schematic drawing of apparatus.

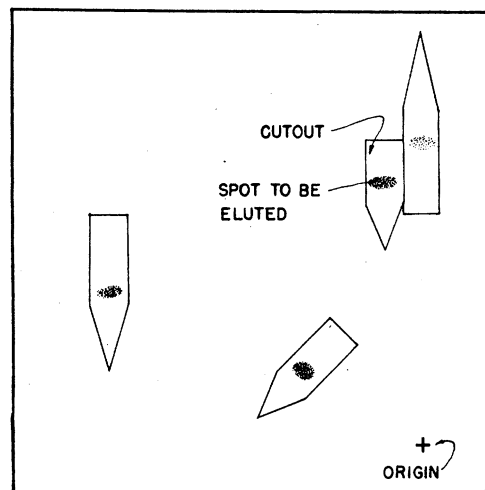


Fig. 2. How spots are cut for elution.

One of the chief advantages of this technique is control of spot size, which is regulated by controlling the air-current velocity. It is quite easy to overload the origin so care must be exercised. This technique was checked by the application of tropaeolin 000 to a transfer wick. With water it appeared to be eluted quantitatively within 2 hr.

It is possible to avoid attaching a paper strip in making a transfer wick from a one-dimensional chromatogram by allowing 1½-in. margins at the origin. This allows for the base of the transfer wick to sit in the eluting solvent without coming in contact with the band of material to be eluted. The opposite margin is allowed for the shaping of the tip.

This method is obviously adaptable to the continuous transfer of substances in solution to the origin of a chromatogram, thus avoiding the tedious, discontinuous application of aliquots from a micropipette.

Chromatographic fractionation can be achieved by an elaboration of this technique. The material should be applied to the transfer wick in a narrow band about ¼ in. above the eluting solvent level. (The transfer wick is made of a single strip of filter paper that is shaped, folded, and stapled.) The chromatograms are changed several times in the course of the elution. Thus the material is fractionated one-dimensionally before being chromatographed in two dimensions. Alternatively, the chromatogram could be a narrow strip that is moved from point to point at predetermined times. A one-dimensional microfractionation is thus achieved.

References and Notes

1. This work was supported in part by National Science Foundation funds provided S. Aronoff. Institute for Atomic Research paper 353.
2. A. M. Moore and J. B. Boylen, *Science* **118**, 19 (1953); A. T. Wilson, Univ. Calif. Rad. Lab. No. 2589, May 1954.
3. R. J. Block, R. LeStrange, and G. Zweig, *Paper Chromatography: A Laboratory Manual* (Academic Press, New York, 1952), p. 36.

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