

CHROM. 3381

Inexpensive preparative thin-layer and thick-layer chromatography

Preparative thin and thick-layer chromatography is a valuable tool for the organic chemist. But, in many cases, the cost of commercial equipment makes its use prohibitive. The following describes a durable, inexpensive, and highly flexible preparative thin and thick-layer system.

Description of the plates

The plates are constructed from sheets of 18 gauge stainless steel cut to the pattern shown in Fig. 1. The 0.50 cm edges are crimped and the corners welded. The bottom flap is crimped again and welded to the side edges (see Fig. 2).

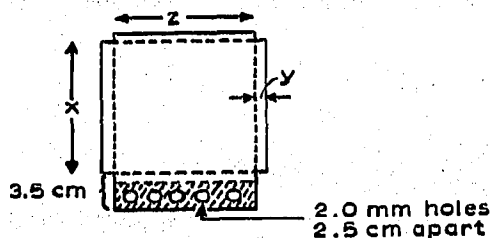


Fig. 1. Pattern for plates. $\gamma = 0.50$ cm; x and $z =$ variable dimensions.

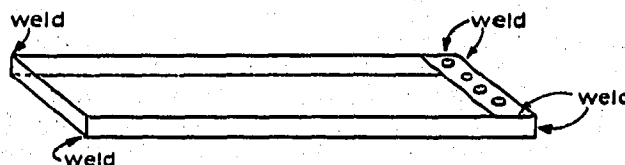


Fig. 2. Side view of assembled plate.

Preparation of layers

The preparative thin layers (less than 1 mm in thickness) are prepared by slurring the adsorbent with chloroform or water to the consistency of a mobile syrup which is then poured onto the center of the plate. The adsorbent is uniformly distributed by tilting the plate until the surface is coated evenly, then the plate is dropped on a level surface several times to compact the adsorbent.

When chloroform is used as the liquid medium, the plates are dried by evaporation of the solvent at room temperature. They may be used without further activation. When water is used, the plates are air dried at room temperature, then activated at 120° for 1 h in an oven.

In the preparation of the thick layers (1 mm up to 5 mm), the same procedure is used except that water is used exclusively.

Developing tank

The developing tank was constructed of light weight stainless steel with the following dimensions: height 50 cm, length 75 cm, width 20 cm. A thin sheet of plywood is used for a cover. Solvent volumes are minimized by tilting the tank (Fig. 3).

Sample application and visualization

Samples are applied and visualized using the usual methods and reagents^{1,2}. I_2 vapor may be used if a cup-like container is constructed from aluminium foil (Fig. 4).

Discussion

In our work, the stainless steel chromatographic system described has proved to be as good as the commercial equipment or better. The plates are unbreakable and therefore do not require special storage facilities. In addition, they can be constructed in any dimensions depending on the specific need. At present, we have been using two

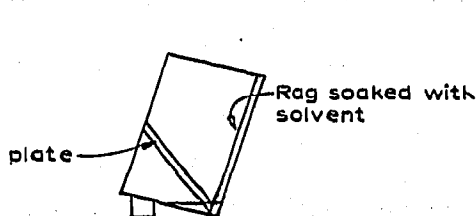


Fig. 3. Developing tank.

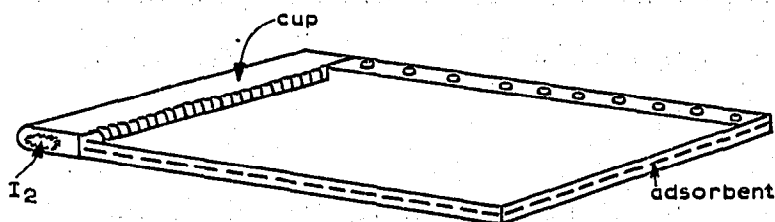


Fig. 4. Cup for staining edges with I_2 vapor.

sizes (30 cm \times 30 cm \times 0.50 cm and 30 cm \times 60 cm \times 0.50 cm) with excellent results in separating quantities from 50 mg up to approximately 10 g.

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