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Note

Simple device to facilitate destaining of polyacrylamide slab gels

JULIE IVORY RUSHBROOK

Department of Biochemistry, Box 8, State University of New York, Downstate Medical Center, 450 Clarkson Ave., Brooklyn, N.Y. 11203 (U.S.A.)

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Sodium dodecyl sulfate (SDS) polyacrylamide slab gel electrophoresis is one of the most commonly used procedures for the analysis of proteins at the present time. Following electrophoresis, proteins are visualized by staining, usually with the dye Coomassie Brillant Blue R-250 in the presence of protein precipitating agents, followed by destaining.

In this laboratory the most satisfactory staining and destaining procedures are obtained by staining the slab gels in a flat plate with agitation, followed by destaining in a suitable solution by the same procedure, *i.e.*, keeping the gel in a flat dish and subjecting it to gentle agitation to allow uniform removal of non-specifically bound dye. This destaining procedure is preferred to that using commercially available slab gel diffusion destaining equipment (such as those of Bio-Rad Labs. and Hoefer Scientific Instruments) which limit the size of the slab to be treated, are not designed to accomodate swelling of the gel during destaining and can produce non-uniform destaining across the gel during the destaining process, which may be of concern if quantification of bands is desired.

However, the destaining procedure described above necessitates changing the destaining solution at least several times a day for several days. This can become tiresome and time consuming, particularly if slab gels are being run frequently.

This report describes a small charcoal destaining device which is placed in the destaining dish along with the slab gel and greatly facilitates the destaining process.

PROCEDURES AND EQUIPMENT

The SDS polyacrylamide slab gel electrophoresis procedure used in the gels described utilizes the buffer system of King and Laemmli[1] with minor modifications, run in the slab mode[2]. The dimensions of the gels are approximately 13 × 16 cm.

Gels are stained overnight in 0.1% Coomassie Brilliant Blue R-250, 50% methanol, 10% acetic acid[3] and destained in 5% *tert.*-butyl alcohol, 7.5% acetic acid[4].

Polyethylene containers, 7/8 in. high × 1.5 in. diameter (Polycons), and polypropylene mesh (250 μm mesh opening) were obtained from Small Parts (Miami, Fl., U.S.A.). Activated charcoal (14 × 40 mesh) was obtained from Bio-Rad Labs. (Richmond, Calif., U.S.A.).

RESULTS AND DISCUSSION

The destaining device consists simply of a polyethylene container with attached lid, a piece of polypropylene mesh, and activated charcoal (Fig. 1). Holes are punched in the container as shown. The destainer is small and is designed to be placed in one corner of the destaining dish along with the slab gel.

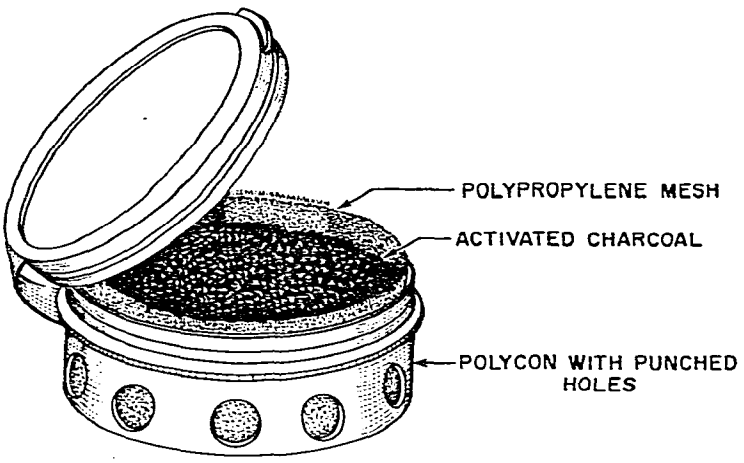

Fig. 1. Design of charcoal destainer for use in diffusion destaining of SDS slab gels in a flat dish with gentle agitation.

The device has a large capacity for the dye and the charcoal may not need replenishment for 6 months or more.

With use of the device, destaining of the gel to a background dye level suitable for photography occurs in approximately 8 h. Further destaining (overnight) will reduce the background staining to zero though this is probably to be avoided. Although fresh destaining solution is prepared for each new gel, this may not be necessary since the components of the destaining solution, acetic acid and *tert.*-butyl alcohol, were chosen to maintain a stable system, *i.e.*, minimize the rate of ester formation.

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