

poured down the 0.15 cm slot between the glass plates. This pouring typically takes up to about four minutes and should not take longer than five minutes, because the reaction between the copolymer and the glyoxal increases the molecular weight of the copolymer (and thereby the solution viscosity), making pouring more difficult. Some 20 to 25 minutes after crosslinker addition, gelation begins and then continues until the gel is firm.

EXAMPLE 2

The gel formed by following the outline just described was used for a poly(acrylamide) gel electrophoresis (PAGE) experiment in which sodium dodecylsulfate (SDS) was present as a denaturing agent for the proteins. Such experiments, which are known in the art as SDS-PAGE, are used to determine the molecular weights of proteins.

Briefly, the experimental details included the following: (a) The proteins used were two sets of known mixtures from Bio-Rad Laboratories (C/N 161-0304 and 161-0303 for the low and high molecular weight standards, respectively) that were dissolved in Tris.HCl; buffer (pH 6.5) with both SDS and 2-mercaptoethanol present. These samples were completely denatured and converted to the dodecyl sulfate/protein complexes which all have approximately the same charge-to-mass ratio. The use of a buffer approximately 2 pH units below the pH of the electrode and the resolving gel buffers causes the negatively charged proteins to carry most of the current in the sample well and stacking gel, as discussed in further detail below, in the early part of the experiment; (b) a "stacking gel" of acrylamide/bis (ca 4% T) was made using Tris.HCl (pH 6.5), and the procedure as described, for example, by U. K. Laemmli, *Nature*, 227:680, 1970. This was placed on top of the glyoxal crosslinked resolving gel of Example 2. The Teflon comb that forms the lanes was inserted into the stacking gel solution just after it was poured. Gelation occurred in less than two hours, and the electrophoresis experiment was begun by removing the comb and loading the lanes with 40 to 50 μ L of the protein standard solutions. (This procedure is referred to as "disc" or "multiphasic buffer" electrophoresis and is generally attributed to U.K. Laemmli [*Nature*, 227:680, 1970.] It is described in the instructions that accompany the Mini Protean II Dual Slab (Electrophoresis) Cell sold by Bio-Rad Laboratories, Richmond, Calif. 94804 (see Example 2 of this document); (c) the electrophoresis apparatus in this example was the Hoefer Model SE 400 (San Francisco, Calif. 94107), vertical slab gel cell. The electrode buffers were the Tris glycinate buffer (pH 8.3) with SDS as shown on page 23 of the Bio-Rad instructions. The actual concentrations of Tris and glycine in the electrode buffers are 0.025M and 0.19M, respectively; (d) the electrical parameters for this experiment were a constant current of 30 mA until the applied

voltage reached 180V, after which the voltage was held constant at 180V and the current slowly declined. It took a little over two hours for the applied voltage to rise to 180V from the initial value of 89V. The entire experiment took almost four hours.

After the electrophoresis was done, the gel was removed from between the glass plates and stained with Coomassie Blue R250 dye dissolved in a solution of methanol (40%), acetic acid (10%), and water (50%). The dye preferentially sorbed in protein-rich areas, giving dark protein bands, and leaving no doubt that electrophoretic migration according to molecular size had taken place with good resolution. A graph of the migration distances (corrected for 4.9% gel swelling in the staining solution) plotted as abscissae and the logarithm molecular weights plotted as ordinates was nearly linear, which is what one often observes for SDS-PAGE. Thus, the gel medium of this Example provided results very similar to those obtained in SDS-PAGE with gels made from acrylamide/bis polymerization.

The invention has been described in detail with particular reference to preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

What is claimed is:

1. A method for preparing an electrophoresis gel medium while minimizing exposure to harmful chemicals which comprises forming a solution of the copolymer of a kit for preparing electrophoresis gel media which comprises, in combination, (1) a copolymer consisting of poly[acrylamide-co-N-(3-acetoacetaamidopropyl)methacrylamide having a weight ratio of acrylamide to the comonomer of 95:5 and (2) in a package separate from said copolymer, a crosslinking agent for reacting with the functional groups on the repeating units in the said copolymer derived from a monomer that contains a functional group that will enter into a crosslinking reaction by other than a free-radical initiated mechanism and an electrophoresis buffer in deionized water employing such proportions of said copolymer, buffer and water as to provide a gel of the desired said copolymer concentration and pH, providing means with which to form a shaped electrophoresis gel medium of the desired dimensions, adding the crosslinking agent from the kit to said solution of said copolymer and buffer in such concentration of crosslinking agent as to cause gelation to occur within a time period of from about 5 minutes to about 15 hours after said addition, and then promptly employing said gel shaping means to form the gel medium of desired dimensions from the gel thereby produced.

2. The method of claim 1 wherein said buffer is tris(-hydroxymethyl)aminoethane.

3. The method of claim 1 wherein said crosslinking agent is glyoxal.

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