

glycidylether was added. A gel which formed after incubation at 35° C. for 2 days showed very good resolution of DNA fragments in the 100-2000 bp range. Another gel was prepared under identical conditions but it contained 0.5% dextran instead of starch. The separation range was the same but DNA bands were less sharp than in the gel comprising starch. A gel comprising 0.5% hydroxyethylcellulose and 1% agarose polymers was also prepared by incubation for 1 day at 35° C. Resolution of DNA fragments was very good and the 104 bp fragment migrated about 0.5 cm less than in the gel comprising starch. Two gels comprising polyvinylalcohol, 0.5 and 1%, in addition to 1% agarose polymers were prepared in the same way. The gel which comprised 0.5% of polyvinylalcohol showed sharper bands and very good resolution in the size range from 120 to 3000 bp.

Gels were also prepared in which the order of reagent addition was changed. Thus, one gel was prepared by adding 2.5 mmol of 1,3-dichloropropanol to a solution of agarose and hydroxyethylcellulose (10 ml, both polymers at 1%) and the other by adding 2.5 mmol of 1,3-dichloropropanol to a solution of agarose followed by addition of hydroxyethylcellulose. The final concentration of each polymer was 1%. The solutions contained 5 mmol of NaOH before addition of the cross-linker. Following incubation at 35° C. for two days, electrophoresis of DNA fragments showed essentially no difference in migration distances between identical DNA fragments run in the two gels.

EXAMPLE 17

Gels comprising agarose and epichlorhydrin prepared by dilution of the cross-linker prior to its addition into the polymer solution. Dioxane (1 ml) was used to dilute the cross-linker (1 mmol) before it was added to 9 ml of 1.1% agarose solution containing 1.1 mmol of NaOH. The gel solution was incubated at 35° C. for two days. Following washing and equilibration, electrophoresis showed very good resolution of DNA fragments.

TABLE 1

Absorbance at 500 nm of gels comprising 2% agarose polymers cross-linked with different amounts of 1,3-dichloropropanol (mmol in 10 ml of gel) prepared as described in Example 7.

mmol	0.0	0.1	0.2	0.4	0.6	1.0	2.0	4.0
A ₅₀₀	0.396	0.191	0.128	0.058	0.024	0.028	0.027	
0.040								

While this invention has been illustrated and described by the specific figures and examples, it is recognized that variations and changes may be made without departing from the invention as set forth in the claims.

What is claimed is:

1. A method of preparing a substantially continuous bed of a water insoluble, substantially transparent gel comprising:

mixing together with an aqueous solvent:

a composition comprising at least one polymer containing hydroxyl groups, said composition comprising a linear polysaccharide; and

a crosslinking agent comprising at least one compound which is substantially devoid of functional groups which are charged, or which become charged upon contact with water, in the pH range of about 2 to 11, and which is able to

react, through at least two reactive groups each of which is selected from the group consisting of epoxides, halides, sulfonates and activated olefins, with hydroxyl groups of said linear polysaccharide to form ether linkages therewith to form a mixture;

subjecting said mixture comprising said linear polysaccharide and crosslinking agent in said aqueous solvent to crosslinking reaction conditions sufficient to:

react reactive groups of said crosslinking agent with hydroxyl groups of said polysaccharide to form an ether linked crosslinked product which is substantially devoid of said charged groups, and

gel said crosslinked polymer substantially simultaneously with said crosslinking reaction, into a bed of water insoluble, substantially transparent, crosslinked gel.

2. A method as claimed in claim 1 including carrying out said substantially simultaneous cross-linking and gelation without any substantial agitation of said solution.

3. The method as claimed in claim 1 wherein said cross linking agent comprises a member selected from the group consisting of bis-epoxides, halo-epoxides, bis-haloalkanes, bis-halo-alcohols, alkanediol-bis-alkyl sulfonates, alkanediol-bis-aryl sulfonates, and divinyl-sulfone.

4. Method of claim 1, wherein the polysaccharide comprises agarose.

5. A method of claim 1, wherein the polysaccharide comprises hydroxyethyl cellulose.

6. A method of claim 1, wherein the polysaccharide comprises hydroxyethyl agarose.

7. A method of claim 1, wherein said polysaccharide comprises a linear and a branched polysaccharide.

8. A method of claim 7, wherein the linear polysaccharide comprises agarose and the branched polysaccharide comprises dextran.

9. A method of claim 7, wherein the linear polysaccharide comprises agarose and the branched polysaccharide comprises starch.

10. A method of claim 1, wherein said polysaccharide comprises more than one linear polysaccharide.

11. A method of claim 10, wherein said polysaccharide comprises agarose and hydroxyethyl cellulose.

12. A method of claim 7, wherein said polysaccharide comprises more than one branched polysaccharide.

13. A method of claim 12, wherein said polysaccharide comprises agarose, hydroxyethyl cellulose and dextran.

14. A method of claim 12, wherein said polysaccharide comprises agarose, hydroxyethyl cellulose and starch.

15. A method according to any one of claims from 4 to 14 wherein said composition additionally contains a synthetic polymer with hydroxyl groups.

16. A method of claim 15, wherein the synthetic polymer is polyvinyl alcohol.

17. A method according to claim 16, wherein the cross-linking agent is selected from a group of compounds consisting of dihaloalkyl alcohols, haloalcohols, bisepoxides, divinyl sulfone, and alkanediol dialkyl or diarylsulfonates.