US005371208A

United States Patent [19]

Kozulic

[11] **Patent Number: 5,371,208**

[45] **Date of Patent: Dec. 6, 1994**

[54] **PREPARATION OF CROSS-LINKED LINEAR POLYSACCHARIDE POLYMERS AS GELS FOR ELECTROPHORESIS**

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[21] Appl. No.: **998,299**

[22] Filed: **Dec. 30, 1992**

[51] **Int. Cl.**[5] **C25B 1/00**; A23J 1/00; C07H 1/00; C07H 13/02

[52] **U.S. Cl.** ..... **536/102**; 536/1.11; 536/115; 536/120; 536/124; 204/403; 204/299 R; 204/182.8; 530/417

[58] **Field of Search** ..... 530/417; 536/1.1, 120, 536/115, 102; 204/403, 299 R, 182.8

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,507,851	4/1970	Ghetie et al.	536/54
3,850,798	11/1974	Sjöquist	530/350
3,860,573	1/1975	Honkanen et al.	536/114
3,956,272	5/1976	Tixier	536/55.1
3,956,273	5/1976	Guiseley	536/120
3,959,251	5/1976	Porath et al.	536/123.1
3,995,018	11/1976	Sjöquist	435/7.92
4,094,832	6/1978	Söderberg	526/238.22
4,290,911	9/1981	Cook et al.	252/315.3
4,312,739	1/1982	Hansson et al.	204/299 R
4,319,975	3/1982	Cook	204/182.8
4,321,121	3/1982	Gurske	204/182.8
4,393,140	7/1983	Schutt	435/226
4,421,650	12/1983	Nagasawa et al.	210/635
4,459,358	7/1984	Berke	436/170
4,504,641	3/1985	Nochumson	526/238.2
4,693,985	9/1987	Degen et al.	436/531
4,930,893	6/1990	Mahian	356/344
5,009,759	4/1991	Serwer et al.	204/182.8
5,202,007	4/1993	Kozulic	204/182.8

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[57] **ABSTRACT**

A bed of transparent, water insoluble, charge-free crosslinked gel which is suitable for use in electrophoresis is prepared. The gel is formed by dissolving a linear polysaccharide, such as agarose, in a suitable solvent, such as water. This dissolution may be accomplished with agitation. A suitable cross linking agent, which is not itself charged, nor does it become charged upon contact with water, at a pH of 2 to 12, is then added to the solution, possibly with agitation in order to get thorough mixing of the linear polysaccharide and the cross linking agent. This mixture is then allowed to incubate and react in a quiescent state to substantially simultaneously gel and crosslink to form the desired cross linked gel bed. Preferred cross-linking agents are bis-epoxides, halo-epoxides, bis-haloalkanes, bis-haloalcohols, alkanediol-bis-alkyl sulfonates, alkanediol-bis-aryl sulfonates or divinylsulfone. The liner polysaccharide maybe mixed with a synthetic polymer such as polyvinyl alcohol.

25 Claims, 6 Drawing Sheets