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**United States Patent** [19][11] **Patent Number:** **5,767,196****Kozulic**[45] **Date of Patent:** **Jun. 16, 1998**[54] **METHOD OF CARRYING OUT  
ELECTROPHORESIS WITH A SUBMERGED  
GEL**[75] **Inventor:** **Branko Kozulic**, Zurich, Switzerland[73] **Assignee:** **GuestElchrom Scientific A.G.**, Cham,  
Switzerland[21] **Appl. No.:** **579,272**[22] **Filed:** **Dec. 27, 1995****Related U.S. Application Data**

[62] Division of Ser. No. 268,436, Jun. 30, 1994, Pat. No. 5,541,255, which is a division of Ser. No. 998,299, Dec. 30, 1992, Pat. No. 5,371,208.

[51] **Int. Cl.**<sup>6</sup> ..... **G01N 27/26**[52] **U.S. Cl.** ..... **525/54.3; 525/54.31; 204/466; 204/470**[58] **Field of Search** ..... 204/466, 470; 525/54.3, 54.31[56] **References Cited****U.S. PATENT DOCUMENTS**

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A method of gel electrophoresis carried out in a submerged gel mode in which the gel is a bed of water insoluble, transparent, cross linked gel, which has been formed by: dissolving a polysaccharide, including at least one linear polysaccharide such as agarose or hydroxyethyl cellulose, in a suitable solvent, such as water; adding a cross linking agent, which is not charged nor becomes charged upon contact with water in a pH in the range of about 2 to 11, to the solution; and incubating this mixture in a quiescent state to substantially simultaneously react the polysaccharide and the cross linking agent and to gel the reaction product into a bed. The polysaccharide is at least one linear polysaccharides, but that linear polysaccharide may also be admixed with other linear polysaccharides and/or at least one non-linear polysaccharide. Synthetic organic polymers may also be admixed in the cross linking reaction mixture. The polysaccharide, and/or other polymers in the cross linking reaction mixture may be charged but are preferably uncharged, but if charged, the charge must be low enough so that the charge of the resulting gel, if any, will not interfere with the use of the gel to support an electrophoresis process carried out in a submerged gel mode. When the linear polysaccharide is agarose, the gel has improved elasticity and transparency.

**38 Claims, 6 Drawing Sheets**