

| Microgel Composition (w/w %) | Viscosity (cSt) | Injection thro' 18 gauge cannula (Y/N) | Refractive Index (w/H20 v %) |
|------------------------------|-----------------|--|------------------------------|
| NVP(55)/VAc(40)/DEGDVE(5)    | 180-250         | Y                                      | 1.39(33)                     |
| NVP(90)/VAc(5)/DEGDVE(5)     | <180            | Y                                      | 1.39(31)                     |
| DMA(80)/HEMA(10)/EGDMA(10)   | 730             | Y                                      | 1.395(38)                    |

## EXAMPLE 14

0.300 g Microgel modified with functional vinyl groups for crosslinking in accordance with Example 11 was weighed into a vial and 0.704 g water was added. On standing, the microgel was dissolved to a clear colorless solution. A photoinitiator for starting the crosslinking was added to the solution (0.102 g) and the mixture was warmed to dissolve. The photoinitiator comprises a photoactive linear polymer of a copolymer of N,N-dimethylacrylamide containing 2.0 mol % of photoactive units derived from 1,6-dimethylbenzoylphosphine oxide. An aliquot of the mixture was easily dispensed through 18 gauge needle to a Teflon disk and covered with a glass slide. On 2 minutes irradiation with blue light (source: Vivadent Heliolux DLX dental gun emitting 400-525 nm), the mixture formed a tack-free gel.

## EXAMPLE 15

Microgel prepared according to Example 11, was dissolved in water to give a 35 w/w % solution. An aliquot of this solution, 358 mg, was mixed with 58 mg of a 25 w/w % solution of the same photoinitiator as in Example 11 and 175 mg of the mixture was transferred through an 18 gauge hypodermic cannula to a Teflon disk. On irradiating with blue light (source: Vivadent Heliolux DLX dental gun, emitting 400-525 nm) for 20 seconds, a transparent gel with elastic properties was formed.

What is claimed is:

1. A method of producing an intraocular lens in vivo, comprising the steps of:

- (i) preparing a composition of discrete water soluble macromolecular particles;
- (ii) mixing said composition with a water soluble photoinitiator and forming an ophthalmically acceptable aqueous solution having a refractive index of at least 1.39;
- (iii) injecting the resultant aqueous solution into the capsular bag of the eye; and
- (iv) initiating crosslinking between said macromolecular particles by irradiation with light of a wavelength in the range of about 380 to 700 nm to create a lens in the capsular bag.

2. A method according to claim 1, wherein the macromolecular particles comprise units of at least one hydrophilic group and at least one group giving a high refractive index.

3. A method according to claim 2, wherein said hydrophilic group is a vinyl lactam or an acrylamide.

4. A method according to claim 3, wherein said vinyl lactam is N-vinylpyrrolidone.

5. A method according to claim 2, wherein said hydrophilic group is N,N-dimethylacrylamide.

6. A method according to claim 1, wherein the macromolecular particles comprise a crosslinking agent.

7. A method according to claim 2, wherein the macromolecular particles further comprise units having functional

groups suitable for crosslinking the particles into a solid elastically deformable lens, said groups being selected from vinylic, acrylic and methacrylic groups.

8. A method according to claim 7, wherein said units are vinyl alcohol units formed by ester-exchange of vinyl acetate units.

9. A method according to claim 7, wherein said functional groups are introduced by attachment to vinylic units of the macromolecular particles.

10. A method according to claim 9, wherein said vinylic units have groups for attaching the functional groups for crosslinking selected among hydroxy groups, epoxy groups, carboxylic anhydride groups, lactone groups and isocyanate groups.

11. A method according to claim 9, wherein said vinylic units are selected from a group consisting of 2-hydroxyethylacrylate, 2-hydroxyethylmethacrylate, 2-aminoethoxyethylacrylate, 2-aminoethylacrylate, 2-aminoethylmethacrylate, glycidylacrylate and glycidylmethacrylate units.

12. A method according to claim 2, wherein the macromolecular particles comprise:

- a) vinyl lactam units and/or acrylamide units
- b) vinylic units comprising functional groups selected among vinyl, acrylate and methacrylate groups; and
- c) a crosslinking agent.

13. A method according to claim 1, wherein the water soluble photoinitiator comprises photoactive groups attached to linear polymers.

14. A method according to claim 1, wherein the water soluble photoinitiator comprises photoactive groups attached to macromolecular particles.

15. A method according claim 13, wherein the photoactive group is selected from acyl- and/or aryl-phosphine oxides.

16. A method according to claim 14, wherein the photoactive group comprises an aryl group selected from a group consisting of 4-carbonylphenylene, 3,5-dimethoxy-4-carbonylphenylene, 3,5-dimethylol-4-carbonylphenylene and 3,5-dimethyl-4-carbonylphenylene.

17. A method according to claim 16, wherein the photoactive group is a 4-vinylbenzoyldiphenylphosphine oxide.

18. A method according to claim 13, wherein the photoinitiator when irradiated by light acts as a crosslinker for the crosslinkable macromolecular particles.

19. A method according to claim 13, wherein the photoinitiator residues subsequent to crosslinking form an integral part of the network constituting the intraocular lens material.

20. A method of producing an intraocular lens including:

- (i) introducing a solution into a lens forming enclosure, said solution comprising discrete crosslinkable units of a size small enough to provide an optically clear solution while contributing to a high refractive index of at least 1.39;
- (ii) performing crosslinking between said units of the solution; and thereby
- (iii) forming a solid lens in said enclosure, optionally under a forming pressure, wherein the solution has a sufficiently low viscosity to be injected with a conventional cannula into the forming enclosure and wherein the forming enclosure is the capsular bag of the eye where the natural lens has been removed with a surgical process.

21. A method according to claim 20, wherein the formed lens is an elastically deformable lens with a modulus in the range of about 0.1 to 20 kPa.

22. A method according to claim 21, wherein the resulting lens formed in the capsular bag has the optical and mechanical characteristics necessary for restoration of accommodation.