

diameters 12 ranging from approximately 4.5 to 7.1 mm and cross-sectional thickness ranging from approximately 2.3 to 3.6 mm.

Exemplary lenses was deformed by heating a water bath to 60° C. and placing a beaker of heptane in the water bath. The lenses were immersed in the warm heptane for approximately 10 seconds and simultaneously folded with a pair of tweezers. The folded lenses were then removed from the heptane and inserted into 1/16 inch I.D. silicone tubes. The tube and folded lenses were then immersed in the warm heptane for 10-20 seconds. The tubes and lenses were removed from the heptane and immediately rolled and squeezed between two fingers, compressing the lenses into tightly folded and elongated shapes. The elongated lenses and tubes were allowed to cool to room temperature and then the lenses were removed from the tubes. At room temperature the lenses remained in their elongated state and had a configuration similar to that illustrated in FIGS. 2a and b. The long dimension 18 ranged from approximately 8 to 13 mm, the cross-sectional widths ranged from approximately 2 to 4 mm, and the cross-sectional heights ranged from approximately 1.8 to 3.0 mm.

Each lens was immersed in physiologically buffered aqueous solutions for 8-48 hours and allowed to hydrate to an equilibrium water content of about 85% by weight. The lenses were observed to expand and reform to the original configuration as illustrated in FIGS. 3a and b. The enlarged reconfigured hydrated lenses had expanded diameters 24 ranging from approximately 8.5 to 9.5 mm and expanded cross-sectional thicknesses 26 of approximately 4.5 mm.

### EXAMPLE 3

Intra-ocular lenses were machined from lens blank formed of polymer 8 of Table I by polymerizing a mixture of N-vinyl imidazole, 4-vinyl pyridine (25 wt %), and tetraethyleneglycol diacrylate with an AIBN initiator. The same general procedure described in Example I was utilized to prepare the mixture filled ampoule for polymerization and the polymerization process also included a 48 hour cycle at 60° C. and a 24 hour cycle at 120° C.

Exemplary lenses were similar in dimensions to those described in Example 2. A typical optical resolution of the exemplary lenses in the dehydrated state was 80% as measured on a Meclab optical bench. The exemplary lenses were then deformed according to the procedures provided in Example 2. After hydration in physiologically buffered aqueous solutions for about 24 hours, the deformed lenses recovered their original configurations. As measured on a Meclab optical bench, a typical optical resolution of 70% was found for the hydrated lenses. This compares favorably with the 60% optical resolution minimally acceptable within the ophthalmic industry.

Having thus described exemplary embodiments of the present invention, it should be noted by those skilled in the art that the disclosures herein are exemplary only and that alternatives, adaptations and modifications may be made within the scope of the present invention.

I claim:

1. A process for fabricating expansile hydrogel intraocular lenses having reduced size for small incision insertion, said process comprising the steps of:

providing a dehydrate hydrogel intraocular lens formed of hydrogel forming polymer;

deforming said dehydrate hydrogel intraocular lens to provide a deformed dehydrated hydrogel intraocular lens sufficiently reduced in size to insert through a 4 mm surgical incision; and cooling said deformed dehydrated hydrogel intraocular lens to a temperature below said elastic deformation temperature of said hydrogel forming polymer, thereby freezing said deformed dehydrated intraocular lens at its reduced size, said deformed dehydrated hydrogel intraocular lens being capable of hydrating to a full size intraocular lens having an optical diameter of from about 6 mm to about 12 mm.

2. The process of claim 1 wherein said dehydrated hydrogel intraocular lens has an optical diameter of from about 3 mm to about 8 mm.

3. The process of claim 1 wherein said deformed dehydrated hydrogel intraocular lens is capable of hydrating to a full size intraocular lens having an optical diameter of from about 8 to about 10 mm.

4. The process of claim 1 wherein said hydrogel forming polymer is an ocular compatible material capable of having a hydrated water content of at least 20 wt %.

5. The process of claim 4 wherein said hydrogel forming polymer is prepared from one or more monomers selected from the group consisting of acrylamides, methacrylamides, water soluble vinyl monomers, acrylate and methacrylate esters having at least one hydroxyl group on a side chain.

6. The process of claim 4 wherein said hydrogel forming polymer is prepared from one or more monomers selected from the group consisting of 2-hydroxyethyl methacrylate, ethylene glycol dimethacrylate, hydroxyethoxyethyl methacrylate, hydroxydiethoxy methacrylate, 2,3 dihydroxypropyl methacrylate, glycerol methacrylate, methoxyethylethoxyethyl methacrylate, methoxydiethoxyethyl methacrylate, methoxyethyl methacrylate, methacrylate acid, vinyl alcohol, vinyl acetate, N-vinyl 2-pyrrolidone, N-vinyl succinimide, N-(3-picoyl) methacrylamide, N-vinylimidazole, and 4-vinylpyridine.

7. The process of claim 1 wherein the elastic deformation temperature of said hydrogel forming material is at least 55° C.

8. The process of claim 1 wherein said dehydrated hydrogel intraocular lens is deformed through compressive elongation into a lozenge configuration.

9. The process of claim 1 wherein the deforming step further comprises heating said dehydrated hydrogel intraocular lens to a temperature at least as high as the elastic deformation temperature of said hydrogel forming polymer.

10. A process for fabricating an expansile hydrogel intraocular lens having reduced size for small incision insertion, said process comprising the steps of:

providing a dehydrate hydrogel intraocular lens formed of hydrogel forming polymer;

deforming said dehydrate hydrogel intraocular lens at a temperature at least as high as the elastic deformation temperature of said hydrogel forming polymer to provide a deformed dehydrated hydrogel intraocular lens sufficiently reduced in size to insert through a 4 mm surgical incision; and

cooling said deformed dehydrated hydrogel intraocular lens to a temperature sufficiently below said elastic deformation temperature to freeze said deformed dehydrated hydrogel intraocular lens at its