This material for intraocular lenses is excellent in flexibility and has a high refractive index. Therefore, a lens with a reduced thickness can be provided, and the lens in a folded state can be inserted through an incision. Moreover, the material for intraocular lenses has excellent transparency and can reduce the occurrence of glistening.

Citation List

Patent Literature

[0004] PTL 1: Japanese Unexamined Patent Application Publication No. 11-56998

Summary

Technical Problem

[0005] In an acrylic elastomer using the material for intraocular lenses in PTL 1, ester moieties may undergo hydrolysis, and dissolution of a hydrolysate may occur although the amount of dissolution is very small. There is therefore a need for a material that can provide an intraocular lens from which only a reduced amount of a hydrolysate dissolves.

[0006] The present disclosure has been made in view of the foregoing circumstances, and it is a primary object to provide a material for intraocular lenses from which only a reduced amount of the hydrolysate dissolves in an aqueous solution.

Solution to Problem

[0007] To achieve the above object, the present inventors have conducted extensive studies and found that, when a material for intraocular lenses containing an acrylate as a base material contains a specific methacrylate, the amount of a hydrolysate dissolved in an aqueous solution can be further reduced while the desired properties of the material for intraocular lenses are maintained or improved. Thus, the present disclosure has been completed.

[0008] Accordingly, a material for intraocular lenses disclosed in the present description comprises: an aromatic ring-containing acrylate structural unit; an alkoxyalkyl methacrylate structural unit including an alkoxyalkyl group having 4 or less carbon atoms; a hydrophilic structural unit based on a hydrophilic monomer; and a cross-linking structural unit based on a cross-linkable monomer.

[0008a] In one aspect, there is provided a material for intraocular lenses comprising:

an aromatic ring-containing acrylate structural unit;

an alkoxyalkyl methacrylate structural unit including an alkoxyalkyl group having 4 or less carbon atoms;

an alkyl acrylate structural unit including an alkyl group having 1 to 20 carbon atoms;

a hydrophilic structural unit based on a hydrophilic monomer; and

a cross-linking structural unit based on a cross-linkable monomer,

wherein the aromatic ring-containing acrylate structural unit is phenoxyethyl acrylate structural unit,
the alkoxyalkyl methacrylate structural unit is an ethoxyethyl methacrylate structural unit,
the alkyl acrylate structural unit is an ethyl acrylate structural unit, and
a base material consisting of the aromatic ring-containing acrylate structural unit, the alkoxyalkyl methacrylate structural unit and the alkyl acrylate structural unit, and
the base material includes one kind of the aromatic ring-containing monomer.

[0009] With this material for intraocular lenses, the amount of a hydrolysate dissolved from the material for intraocular lenses in an aqueous solution can be further reduced. The reason that this effect is obtained may be, for example, as follows. For example, methacrylate is a material harder than acrylate because of the presence of a methyl group but may resist attack by water. Therefore, hydrolysis resistance may be improved. In the case that the alkoxyalkyl group having 4 or less carbon atoms is included, the number of carbon atoms is preferable, and therefore the material for intraocular lenses may not be excessively hard

CLAIMS

1. A material for intraocular lenses comprising:

an aromatic ring-containing acrylate structural unit;

an alkoxyalkyl methacrylate structural unit including an alkoxyalkyl group having 4 or less carbon atoms;

an alkyl acrylate structural unit including an alkyl group having 1 to 20 carbon atoms;

a hydrophilic structural unit based on a hydrophilic monomer; and

a cross-linking structural unit based on a cross-linkable monomer,

wherein the aromatic ring-containing acrylate structural unit is phenoxyethyl acrylate structural unit,

the alkoxyalkyl methacrylate structural unit is an ethoxyethyl methacrylate structural unit,

the alkyl acrylate structural unit is an ethyl acrylate structural unit, and

a base material consisting of the aromatic ring-containing acrylate structural unit, the alkoxyalkyl methacrylate structural unit and the alkyl acrylate structural unit, and the base material includes one kind of the aromatic ring-containing monomer.

2. The material for intraocular lenses according to claim 1, wherein the alkoxyalkyl methacrylate structural unit is included in an amount within the range of from 10 parts by mass to 70 parts by mass inclusive based on 100 parts by mass of the total amount of the base material.

3. The material for intraocular lenses according to claim 1 or 2, wherein the alkoxyalkyl methacrylate

structural unit is included in an amount within the range of from 10 parts by mass to 40 parts by mass inclusive based on 100 parts by mass of the total amount of the base material.

4. The material for intraocular lenses according to any one of claims 1 to 3, wherein the hydrophilic structural unit is included in an amount within the range of from 15 parts by mass to 35 parts by mass inclusive by the outside ratio based on 100 parts by mass of the total amount of the base material.

5. The material for intraocular lenses according to any one of claims 1 to 4, wherein the cross-linking structural unit is included in an amount within the range of from 2 parts by mass to 4 parts by mass inclusive by the outside ratio based on 100 parts by mass of the total amount of the base material.

6. The material for intraocular lenses according to any one of claims 1 to 5, wherein the alkyl acrylate structural unit is included in an amount within the range of from 10 parts by mass to 35 parts by mass inclusive based on 100 parts by mass of the total amount of the base material.

7. The material for intraocular lenses according to any one of claims 1 to 6, wherein the aromatic ring-containing acrylate structural unit is included in an amount within the range of from 15 parts by mass to 80 parts by mass inclusive based on 100 parts by mass of the total amount of the base material.

8. The material for intraocular lenses according to any one of claims 1 to 7, wherein the hydrophilic structural unit is a hydroxyethyl methacrylate structural unit.

9. The material for intraocular lenses according to any one of claims 1 to 8, wherein the cross-linking structural unit is a butanediol diacrylate structural unit.

10. The material for intraocular lenses according to any one of claims 1 to 9, wherein the aromatic ring-containing acrylate structural unit is included in an amount within the range of from 30 parts by mass to 80 parts by mass inclusive

based on 100 parts by mass of the total amount of the base material,

the alkoxyalkyl methacrylate structural unit is included in an amount within the range of from 10 parts by mass to 40 parts by mass inclusive based on 100 parts by mass of the total amount of the base material,

the alkyl acrylate structural unit is included in an amount within the range of from 10 parts by mass to 35 parts by mass inclusive based on 100 parts by mass of the total amount of the base material.