

Claims

1. Composition for producing a PMMA-based cast polymer, characterized in that the composition contains 1% to 10% by weight of urea and/or urea derivatives, 0.001 to 2.0% by weight of an initiator, 0% to 20% by weight of a further non-polymerizable blowing agent, 0% to 5% by weight of a chain-transfer agent, 0.5% to 10% by weight of a hydrophilic inorganic compound essentially not soluble in the composition, and 53% to 98.498% by weight of a monomer mixture consisting of 60% to 95% by weight of MMA, 5% to 40% by weight of acrylic, methacrylic and/or itaconic acid, less than 4% by weight of styrene, α -methylstyrene and/or chlorostyrene, and 0% to 35% by weight of further MMA-copolymerizable monomers other than urea derivatives, wherein the inorganic hydrophilic compound has a methanol wettability of less than 30% by volume of methanol in a methanol/water mixture.
2. Composition according to Claim 1, characterized in that the composition contains 2% to 8% by weight of urea and/or urea derivatives, 0.002 to 1.0% by weight of an initiator, 0% to 20% by weight of a further non-polymerizable blowing agent, 0% to 5% by weight of a chain-transfer agent, 1% to 8% by weight of a hydrophilic inorganic compound, and 57% to 96.999% by weight of a monomer mixture consisting of 70% to 90% by weight of MMA, 10% to 30% by weight of acrylic, methacrylic and/or itaconic acid, less than 2% by weight of styrene, α -methylstyrene and/or chlorostyrene, and 0% to 35% by weight of further MMA-copolymerizable monomers other than urea derivatives.
3. Composition according to at least one of Claims 1 or 2, characterized in that the monomer mixture contains essentially no styrene, α -methylstyrene and/or chlorostyrene.
4. Composition according to at least one of Claims 1 to 3, characterized in that the hydrophilic inorganic compound is chosen from the group consisting of silica, metal oxides, metal hydroxides, metal silicates, talcum, and the mixtures thereof.
5. Composition according to at least one of Claims 1 to 4, characterized in that the hydrophilic inorganic compound has an average diameter d_{50} of between 5 and 1000 nm, determined according to ASTM 690-1992.
6. Composition according to at least one of Claims 1 to 5, characterized in that the monomer mixture contains at least 0.01% by weight of the further MMA-copolymerizable monomers and in that these monomers are crosslinkers, in particular, ethylene glycol dimethacrylate, triallyl cyanurate, triallyl isocyanurate, allyl methacrylate, or a mixture thereof.
7. Composition according to at least one of Claims 1 to 6, characterized in that the urea derivatives are chosen from the group consisting of an N-alkylurea, an N,N'-dialkylurea, 2-imidazolidones, 1-methyl-2-imidazolidinones, and the mixtures thereof.

8. Composition according to at least one of Claims 1 to 7, characterized in that the urea derivatives are at least partly copolymerizable with MMA urea derivatives, in particular N-(2-methacryloyloxyethyl)ethyleneurea.
9. Composition according to at least one of Claims 1 to 8, characterized in that the monomer mixture contains between 5% and 10% by weight of tert-butyl methacrylate, isopropyl methacrylate, tert-butyl acrylate and/or isopropyl acrylate.
10. PMMA-based cast polymer, obtainable by polymerization of the composition according to at least one of Claims 1 to 9.
11. Process for producing a PMMA-based cast polymer, characterized in that the composition according to at least one of Claims 1 to 9, is polymerized at a temperature between 20°C and 100°C.
12. PMMA-based foam, obtainable by foaming of the cast polymer according to Claim 10 or by foaming of the at least partly polymerized composition according to at least one of Claims 1 to 9.
13. PMMA-based foam according to Claim 12, wherein the foam has a density of between 30 kg/m³ and 350 kg/m³, determined according to DIN EN ISO 1183.
14. Process for producing a PMMA-based foam according to at least one of Claims 12 to 13, characterized in that the composition according to at least one of Claims 1 to 9 is polymerized at a temperature between 20°C and 100°C and is subsequently foamed at a temperature between 130°C and 250°C.
15. Process according to Claim 14, characterized in that the polymerization and foaming are carried out at least partly simultaneously.