Claims

1. Process for producing a polymethacrylate foam, wherein a composition containing from 0.01 to 2.0 wt% of an initiator, from 2 to 20 wt% of a blowing agent, from 0.2 to 10 wt% of silicon oxide particles having a diameter between 4 and 1000 nm and from 70 to 97.79 wt% of a polymer-forming mixture, wherein said polymer-forming mixture comprising MMA and/or MMA repeat units to an extent of not less than 75 mol% and may be present as polymer and/or oligomer to an extent of from 0 to 80 wt%, is polymerized at a temperature between 20°C and 100°C and subsequently foamed at between 130°C and 250°C.

2. Process according to Claim 1, wherein the composition contains from 0.5 to 8 wt% of SiO_2 particles having a diameter between 5 and 500 nm.

3. Process according to one or more of Claims 1 to 2, wherein the temperature is between 30°C and 70°C for the polymerization and between 150°C and 230°C for the foaming.

4. Process according to one or more of Claims 1 to 3, wherein the polymer-forming composition contains up to 0.5 wt% of crosslinker and/or up to 1.5 wt% of chain transfer agent.

5. Process according to one or more of Claims 1 to 4, wherein the polymer-forming mixture contains MMA-copolymerizable comonomers and/or –copolymerized comonomers in the polymers and/or oligomers, and in that the comonomers comprise (meth)acrylic acid, methyl acrylate, ethyl (meth)acrylate, propyl (meth)acrylate, n-butyl (meth)acrylate, tert-butyl (meth)acrylate, isopropyl (meth)acrylate, isobutyl (meth)acrylate, styrene, (meth)acrylamide, an N-alkyl(meth)acrylamide having one to 12 carbon atoms in the alkyl group, a hydroxyalkyl (meth)acrylate having one to 4 carbon atoms in the alkyl group or mixtures of two or more thereof.

6. Process according to one or more of Claims 1 to 5, wherein the polymerization and/or the foaming are/is effected stagewise at different temperatures.

7. Process according to one or more of Claims 1 to 6, wherein the polymerization and the foaming are effected simultaneously to some extent at least.

8. Process according to one or more of Claims 1 to 7, wherein the blowing agent comprises tert-butyl (meth)acrylate, isopropyl (meth)acrylate, tert-butanol, tert-butyl methyl ether, isopropanol and poly(tert-butyl (meth)acrylate), wherein isopropyl (meth)acrylate and/or

tert-butyl (meth)acrylate are/is at the same time part of the recited monomer composition and are wholly or partly copolymerized into the polymers formed therefrom.

5