Claims

1. A poly alkyl(meth)acrylate polymer, obtainable by polymerizing a monomer composition comprising:

(a) 5 to 35 % by weight of one or more esters of (meth)acrylic acid and a first hydroxylated hydrogenated polybutadiene having a number-average molecular weight of 500 to less than 3,000 g/mol, based on the total weight of the monomer composition;

(b) 1 to 15 % by weight of one or more esters of (meth)acrylic acid and a second hydroxylated hydrogenated polybutadiene having a number-average molecular weight of 3,000 to 10,000 g/mol, based on the total weight of the monomer composition;

(c) 5 to 90 % by weight of one or more C_1-C_{30} alkyl(meth)acrylates, based on the total weight of the monomer composition,

wherein the total weight of monomers (a) and (b) is at least 25 % by weight, based on the total weight of the monomer composition, and

wherein the total weight of monomers (a), (b) and (c) is at least 35 % by weight, based on the total weight of the monomer composition.

2. The polymer according to claim 1, wherein the weight ratio of component (a) to component (b) is 1 or more, preferably 1.5 to 15, more preferably 2 to 7, even more preferably 3 to 6, most preferably 3.5 to 6.

3. The polymer according to claim 1 or 2, wherein the first hydroxylated hydrogenated polybutadiene has a number-average molecular weight of 1,000 to 2,750 g/mol, preferably 1,500 to 2,500 g/mol, more preferably 1,750 to 2,250 g/mol, and the second hydroxylated hydrogenated polybutadiene has a number-average molecular weight of 3,500 to 7,000 g/mol, preferably 4,000 to 6,000 g/mol, more preferably 4,500 to 5,000 g/mol.

4. The polymer according to any one of claims 1 to 3, wherein the monomer composition comprises as component (a) preferably 15 to 35 % by weight, more preferably 20 to 30 % by weight of one or more esters of (meth)acrylic acid and the first hydroxylated hydrogenated polybutadiene, based on the total weight of the monomer composition, and as component (b) preferably 3 to 15 % by weight, more preferably 4 to 10 % by weight of one or more esters of (meth)acrylic acid and the second hydroxylated hydrogenated polybutadiene, based on the total weight of the monomer composition.

5. The polymer according to any one of claims 1 to 4, wherein the monomer composition comprises as component (c) a mixture of one or more C_{1-4} alkyl (meth)acrylates and one or more C_{10-18} alkyl (meth)acrylates;

preferably 1 to 80 % by weight of one or more C_{1-4} alkyl (meth)acrylates and 0.1 to 15 % by weight of one or more C_{10-18} alkyl (meth)acrylates, based on the total weight of the monomer composition, more preferably 5 to 70 % by weight of one or more C_{1-4} alkyl (meth)acrylates and 0.1 to 10 % by weight of one or more C_{10-18} alkyl (meth)acrylates, based on the total weight of the monomer composition,
most preferably 7 to 68 % by weight of one or more C_{1-4} alkyl (meth)acrylates and 0.2 to 8 % by weight of one or more C_{10-18} alkyl (meth)acrylates, based on the total weight of the monomer composition.

6. The polymer according to any one of claims 1 to 5, wherein the monomer composition comprises as component (d) 0.1 to 65 % by weight, preferably 0.2 to 60 % by weight of one or more styrene monomers having from 8 to 17 carbon atoms, based on the total weight of the monomer composition.

7. The polymer according to any one of claims 1 to 6, wherein the monomer composition comprises
(a) 20 to 30 % by weight of one or more esters of (meth)acrylic acid and a first hydroxylated hydrogenated polybutadiene having a number-average molecular weight of 1,000 to 2,750 g/mol, based on the total weight of the monomer composition;
(b) 2 to 10 % by weight of one or more esters of (meth)acrylic acid and a second hydroxylated hydrogenated polybutadiene having a number-average molecular weight of 3,500 to 7,000 g/mol, based on the total weight of the monomer composition;
(c) 7 to 68 % by weight of one or more C_{1-4} alkyl (meth)acrylates and 0.2 to 8 % by weight of one or more C_{10-18} alkyl (meth)acrylates, based on the total weight of the monomer composition; and
(d) 0.2 to 65 % by weight of one or more styrene monomers having from 8 to 17 carbon atoms, based on the total weight of the monomer composition.

8. The polymer according to any one of claims 1 to 7, having a weight average molecular weight (M_w) of 15,000 to 350,000 g/mol, preferably 30,000 to 350,000 g/mol, more preferably 40,000 to 200,000 g/mol, most preferably 60,000 to 150,000 g/mol.

9. A method for manufacturing a polyalkyl(meth)acrylate polymer, the method comprising the steps of:
(a) providing a monomer composition according to any one of claims 1 to 8; and
(b) initiating radical polymerization in the monomer composition.

10. Use of the polyalkyl(meth)acrylate polymer according to any one of claims 1 to 8 as an additive for a lubricant composition for improving the viscosity index and the shear-resistance of the lubricant composition.

11. A composition comprising:

(a) a base oil; and

(b) a polyalkyl(meth)acrylate polymer according to any one of claims 1 to 8.

12. The composition according to claim 11, wherein the base oil is a polyalphaolefin base oil, an API Group III base oil, a mixture of a polyalphaolefin base oil with an API Group III base oil, or a mixture of API Group III base oils.

13. The composition according to claim 11 or 12, comprising 40 to 80 % by weight, preferably 50 to 70 % by weight base oil, and 20 to 60 % by weight, preferably 30 to 50 % by weight of the polymer, based on the total weight of the composition.

14. The composition according to claim 11 or 12, comprising 50 to 99.5 % by weight, preferably 65 to 99.5 % by weight base oil, and 0.5 to 50 % by weight, preferably 0.5 to 35 % by weight of the polymer, based on the total weight of the composition.