Claims:

1. A process for the preparation of an aqueous slurry comprising a plurality of copolymer particles suspended therein, the process comprising at least the steps of:

a) providing a reaction medium comprising an organic diluent, and at least two monomers whereby at least one monomer is an isoolefin and at least one monomer is a multiolefin;

b) polymerizing the monomers within the reaction medium in the presence of an initiator system to form a medium comprising the copolymer, the organic diluent and optionally residual monomers

c) contacting the medium obtained in step b) with an aqueous medium comprising at least one LCST compound having a cloud point of 0 to 100℃, preferably 5 to 100℃, more preferably 15 to 80℃ and even more preferably 20 to 70℃ and removing at least partial ly the organic diluent and to the extent present in the medium removing at least partially the residual monomers to obtain the aqueous slurry comprising the copolymer particles

whereby the aqueous medium contains 20,000 ppm or less, preferably 10,000 ppm or less, more preferably 8,000 ppm or less, even more preferably 5,000 ppm or less and yet even more preferably 2,000 ppm or less of non-LCST compounds whereby the non-LCST compounds are

- selected from the group consisting of ionic or non-ionic surfactants, emulsifiers, and antiagglomerants or are in another embodiment
- salts of (mono- or multivalent) metal ions or are in another embodiment
- carboxylic acid salts of multivalent metal ions or are in another embodiment
- stearates or palmitates of mono- or multivalent metal ions or are in another embodiment
- calcium and zinc stearates or palmitates.

2. The process according to claim 1, wherein LCST compounds are those having a cloud point of 0 to 100℃, preferably 5 to 100℃, more preferably 15 to 80℃ and even more preferably 20 to 80℃ determined by a t least one of the following methods:

- DIN EN 1890 of September 2006, method A
- DIN EN 1890 of September 2006, method C
- DIN EN 1890 of September 2006, method E
- DIN EN 1890 of September 2006, method A wherein the amount of compound tested is reduced from 1g per 100 ml of distilled water to 0.05 g per 100 ml of distilled water
- DIN EN 1890 of September 2006, method A wherein the amount of compound tested is reduced from 1g per 100 ml of distilled water to 0.2 g per 100 ml of distilled water.

3. The process according to claim 1, wherein LCST compounds are those having a cloud point of 0 to 100°C, preferably 5 to 100°C, more preferably 15 to 80°C and even more preferably 20 to 80°C determined by at least one of the following methods:

- DIN EN 1890 of September 2006, method A
- DIN EN 1890 of September 2006, method E
- DIN EN 1890 of September 2006, method A wherein the amount of compound tested is reduced from 1g per 100 ml of distilled water to 0.05 g per 100 ml of distilled water.

4. The process according to claim 1, wherein LCST compounds are those having a cloud point of 0 to 100°C, preferably 5 to 100°C, more preferably 15 to 80°C and even more preferably 20 to 80°C determined by at least one of the following methods:

- DIN EN 1890 of September 2006, method A
- DIN EN 1890 of September 2006, method C
- DIN EN 1890 of September 2006, method A wherein the amount of compound tested is reduced from 1g per 100 ml of distilled water to 0.05 g per 100 ml of distilled water.

5. The process according to one of claims 1 to 4, wherein the aqueous medium comprises additionally 500 ppm or less, preferably 100 ppm or less, more preferably 50 ppm or less, even more preferably 30 ppm or less and yet even more preferably 10 ppm or less and in another yet even more preferred

embodiment 1.000 ppm or less of non-LCST compounds whereby the non-LCST compounds are selected from the fives groups listed in claim 1.

6. The process according to one of claims 1 to 5, wherein the aqueous medium comprises additionally 550 ppm or less, preferably 400 ppm or less, more preferably 300 ppm or less, even more preferably 250 ppm or less and yet even more preferably 150 ppm or less and in another yet even more preferred embodiment 100 ppm or less of salts of metal ions calculated on their metal content and with respect to the amount of copolymer present in the medium obtained according to step b).

7. The process according one of claims 1 to 6, wherein the aqueous medium contains additionally contains 550 ppm or less, preferably 400 ppm or less, more preferably 300 ppm or less, even more preferably 250 ppm or less and yet even more preferably 150 ppm or less and in another yet even more preferred embodiment 100 ppm or less of salts of multivalent metal ions calculated on their metal content and with respect to the amount of copolymer present in the medium obtained according to step b).

8. The process according to one of claims 1 to 7, wherein the aqueous medium contains 8,000 ppm or less, preferably 5,000 ppm or less, more preferably 2,000 ppm or less, yet even more preferably 1,000 ppm or less of non-ionic surfactants being non-LCST compounds with respect to the amount of copolymer present in the medium obtained according to step b).

9. The process according to one of claims 1 to 8, wherein the aqueous medium comprises 70 ppm or less, preferably 50 ppm or less, more preferably 30 ppm or less and even more preferably 20 ppm or less and yet even more preferably 10 ppm or less of salts of multivalent metal ions calculated on their metal content and with respect to the amount of copolymer present in the medium obtained according to step b).

10. The process according to one of claims 1 to 9, wherein the aqueous medium comprises 25 ppm or less, preferably 10 ppm or less, more preferably 8 ppm or less and even more preferably 7 ppm or less and yet even more preferably 5 ppm or less of salts of multivalent metal ions calculated on their metal content and with respect to the amount of copolymer present in the medium obtained according to step b).

11. The process according to one of claims 1 to 10, wherein the aqueous medium contains 550 ppm or less, preferably 400 ppm or less, more preferably 300 ppm or less, even more preferably 250 ppm or less and yet even more preferably 150 ppm or less and in another yet even more preferred embodiment 100 ppm or less of carboxylic acid salts of multivalent metal ions calculated on their metal content and with respect to the amount of copolymer present in the medium obtained according to step b), whereby in a preferred embodiment the carboxylic acids are selected from those having 6 to 30 carbon atoms, preferably 8 to 24 carbon atoms, more preferably 12 to 18 carbon atoms and are most preferably calcium stearate and/or zinc stearate and/or calcium palmitate and/or zinc palmitate.

12. The process according to one of claims 1 to 11, wherein the aqueous medium comprises 70 ppm or less, preferably 50 ppm or less, more preferably 30 ppm or less and even more preferably 20 ppm or less and yet even more preferably 10 ppm or less of carboxylic acid salts of multivalent metal ions calculated on their metal content and with respect to the amount of copolymer present in the medium obtained according to step b), whereby the carboxylic acids are selected from those having 6 to 30 carbon atoms, preferably 8 to 24 carbon atoms, more preferably 12 to 18 carbon atoms.

13. The process according to one of claims 1 to 12, wherein the aqueous medium comprises 25 ppm or less, preferably 10 ppm or less, more preferably 8 ppm or less and even more preferably 7 ppm or less and yet even more preferably 5 ppm or less of carboxylic acid salts of multivalent metal ions calculated on their metal content and with respect to the amount of copolymer present in the medium obtained according to step b), whereby the carboxylic acids are selected from those having 6 to 30 carbon atoms, preferably 8 to 24 carbon atoms, more preferably 12 to 18 carbon atoms.

14. The process according to one of claims 1 to 13, wherein the aqueous medium is free of carboxylic acid salts of multivalent metal ions whereby the carboxylic acids are selected from those having 6 to 30 carbon atoms, preferably 8 to 24 carbon atoms, more preferably 12 to 18 carbon atoms.

15. The process according to claim 11, 12, 13 or 14, wherein the carboxylic acids are selected from monocarboxylic acids, preferably saturated monocarboxylic acids, more preferably palmitic, oleic or stearic acid.

16. The process according to one of claims 1 to 15, wherein the aqueous medium comprises 100 ppm or less, preferably 50 ppm or less, more preferably 20 ppm or less and even more preferably 15 ppm or less and yet even more preferably 10 ppm or less of salts of monovalent metal ions calculated on their metal content and with respect to the amount of copolymer present in the medium obtained according to step b).

17. The process according to one of claims 1 to 16, wherein the aqueous medium comprises 100 ppm or less, preferably 50 ppm or less, more preferably 30 ppm or less, even more preferably 20 ppm or less and yet even more preferably 10 ppm or less and in another yet even more preferred embodiment 5 ppm or less of carboxylic acid salts of monovalent metal ions, preferably those selected from the group consisting of sodium stearate, sodium palmitate, sodium oleate, potassium stearate, potassium palmitate and potassium oleate calculated on their metal content and with respect to the amount of copolymer present in the medium obtained according to step b), whereby the carboxylic acids are selected from those having 6 to 30 carbon atoms, preferably 8 to 24 carbon atoms, more preferably 12 to 18 carbon atoms.

18. The process according to one of claims 1 to 17, wherein the aqueous medium is free of carboxylic acid salts of monovalent metal ions whereby the carboxylic acids are selected from those having 6 to 30 carbon atoms, preferably 8 to 24 carbon atoms, more preferably 12 to 18 carbon atoms, preferably monocarboxylic acids more preferably saturated monocarboxylic acids such as palmitic, oleic or stearic acid.

19. The process according to one of claims 1 to 18, wherein the aqueous medium contains 550 ppm or less, preferably 400 ppm or less, more preferably 300 ppm or less, even more preferably 250 ppm or less and yet even more preferably 150 ppm or less of

- carbonates of multivalent metal ions calculated on their metal content and with respect to the amount of copolymer present in the organic medium obtained according to step b) or in another embodiment of
- magnesium carbonate and calcium carbonate calculated on their metal content and with respect to the amount of copolymer present in the organic medium obtained according to step b).

20. The process according to one of claims 1 to 19, wherein the aqueous medium comprises 70 ppm or less, preferably 50 ppm or less, more preferably 30 ppm or less and even more preferably 20 ppm or less and yet even more preferably 10 ppm or less of

- carbonates of multivalent metal ions calculated on their metal content and with respect to the amount of copolymer present in the organic medium obtained according to step b).

21. The process according to one of claims 1 to 20, wherein the aqueous medium comprises 500 ppm or less, preferably 200 ppm or less, more preferably 100 ppm or less, even more preferably 50 ppm or less and yet even more preferably 20 ppm or less and in another yet even more preferred embodiment no layered minerals such as talcum calculated with respect to the amount of copolymer present in the medium obtained according to step b).

22. The process according to one of claims 1 to 21, wherein the aqueous medium comprises 500 ppm or less, preferably 200 ppm or less, more preferably 100 ppm or less, even more preferably 20 ppm or less and yet even more preferably 10 ppm or less and in another yet even more preferred embodiment 5 ppm or less and yet even more preferably no dispersants, emulsifiers or anti-agglomerants other than the LCST compounds defined for step c).

23. The process according to one of claims 1 to 22, wherein the aqueous slurry comprises at least 10 discrete copolymer particles per liter suspended therein, preferably at least 20 discrete particles per liter, more preferably at least 50 discrete particles per liter and even more preferably at least 100 discrete particles per liter.

24. The process according to one of claims 1 to 23, wherein copolymer particles are discrete particles of any form and consistency, which in a preferred embodiment have a particle size of between 0.05 mm and 25 mm, more preferably between 0.1 and 20 mm.

25. The process according to one of claims 1 to 24, wherein copolymer particles have a weight average particle size of from 0.3 to 10.0 mm.

26. The process according to one of claims 1 to 25, wherein the aqueous medium comprises of from 1 to 2,000 ppm of antioxidants, preferably of from 50 to

1,000 ppm more preferably of from 80 to 500 ppm calculated with respect to the amount of copolymer present in the medium obtained according to step b).

27. The process according to one of claims 1 to 26, wherein the at least one isoolefin is selected from the the group consisting of isoolefin monomers having from 4 to 16 carbon atoms, preferably 4 to 7 carbon atoms, more preferably isobutene, 2-methyl-1-butene, 3-methyl-1-butene, 2-methyl-2-butene.

28. The process according to one of claims 1 to 27, wherein the isoolefin is isobutene.

29. The process according to one of claims 1 to 28, wherein the at least one multiolefin is selected from the the group consisting of isoprene, butadiene, 2-methylbutadiene, 2,4-dimethylbutadiene, piperyline, 3-methyl-1,3-pentadiene, 2,4-hexadiene, 2-neopentylbutadiene, 2-methyl-1,5-hexadiene, 2,5-dimethyl-2,4-hexadiene, 2-methyl-1,4-pentadiene, 4-butyl-1,3-pentadiene, 2,3-dimethyl-1,3-pentadiene, 2,3-dibutyl-1,3-pentadiene, 2-ethyl-1,3-pentadiene, 2-ethyl-1,3-butadiene, 2-methyl-1,6-heptadiene, cyclopentadiene, methylcyclopentadiene, cyclohexadiene and 1-vinyl-cyclohexadiene.

30. The process according to one of claims 1 to 29, wherein the multiolefin is isoprene.

31. The process according to one of claims 1 to 30, wherein the monomers are isobutylene and isoprene.

32. The process according to one of claims 1 to 31, wherein at least one further monomers is selected from the group consisting of β-pinene, styrene, divinylbenzene, diisopropenylbenzene o-, m- and p-alkylstyrenes such as o-, m- and p-methyl-styrene.

33. The process according to one of claims 1 to 32, wherein the monomers employed in step a) comprise in the range of from 80 wt.-% to 99.5 wt.-%, preferably of from 85 wt.-% to 98.0 wt.-%, more preferably of from 85 wt.-% to 96.5 wt.-%, even more preferably of from 85 wt.-% to 95.0 wt.-%, by weight of at least one isoolefin monomer and in the range of from 0.5 wt.-% to 20 wt.-%, preferably of from 2.0 wt.-% to 15 wt.-%, more preferably of from 3.5 wt.-% to 15 wt.-%, and yet even more preferably of from 5.0 wt.-% to 15 wt.-% by weight of at least one multiolefin monomer based on the weight sum of all monomers employed.

34. The process according to one of claims 1 to 33, wherein the monomers comprise in the range of from 90 wt.-% to 95 wt.-% of at least one isoolefin monomer and in the range of from 5 wt.-% to 10 wt.-% by weight of a multiolefin monomer based on the weight sum of all monomers employed.

35. The process according to one of claims 1 to 34, wherein the monomers comprise in the range of from 92 wt.-% to 94 wt.-% of at least one isoolefin monomer and in the range of from 6 wt.-% to 8 wt.-% by weight of at least one multiolefin monomer based on the weight sum of all monomers employed.

36. The process according to one of claims 1 to 35, wherein the monomers are present in the reaction medium in an amount of from 0.01 wt.-% to 80 wt.-%, preferably of from 0.1 wt.-% to 65 wt.-%, more preferably of from 10.0 wt.-% to 65.0 wt.-% and even more preferably of from 25.0 wt.-% to 65.0 wt.-%.

37. The process according to one of claims 1 to 36, wherein the organic diluents are hydrochlorocarbon(s) or hydrofluorocarbons represented by the formula: $C_xH_yF_z$ wherein x is an integer from 1 to 40, alternatively from 1 to 30, alternatively from 1 to 20, alternatively from 1 to 10, alternatively from 1 to 6, alternatively from 2 to 20 alternatively from 3 to 10, alternatively from 3 to 6, most preferably from 1 to 3, wherein y and z are integers and at least one or hydrocarbons, preferably alkanes which in a further preferred embodiment are those selected from the group consisting of propane, isobutane, pentane, methycyclopentane, isohexane, 2-methylpentane, 3-methylpentane, 2-methylbutane, 2,2-dimethylbutane, 2,3-dimethylbutane, 2-methylhexane, 3-methylhexane, 3-ethylpentane, 2,2-dimethylpentane, 2,3-dimethylpentane, 2,4-dimethylpentane, 3,3-dimethyl pentane, 2-methylheptane, 3-ethylhexane, 2,5-dimethylhexane, 2,2,4,-trimethylpentane, octane, heptane, butane, ethane, methane, nonane, decane, dodecane, undecane, hexane, methyl cyclohexane, cyclopropane, cyclobutane, cyclopentane, methylcyclopentane, 1,1-dimethylcycopentane, cis-1,2-dimethylcyclopentane, trans-1,2-dimethylcyclopentane, trans-1,3-dimethyl-cyclopentane, ethylcyclopentane, cyclohexane, methylcyclohexane mixtures of the aforementioned diluents.

38. The process according to one of claims 1 to 37, wherein the polymerization according to step b) is carried out either as slurry polymerization or solution polymerization.

39. The process according to one of claims 1 to 38, wherein step b) or step c) are independently are carried out batchwise or continuously, preferably continuously and in a preferred emdiment both steps b) and step c) are carried continuously.

40. The process according to to one of claims 1 to 39, wherein the initiator comprises aluminium trichloride, preferably in a wt.-ratio of isobutylene to aluminum trichloride of 500 to 20000, preferably 1500 to 10000.

41. The process according to claim 40, wherein water and/or alcohols, preferably water is used as proton source, preferably in an amount of from 0.05 to 2.0 moles of water per mole of aluminum in the aluminum trichloride, preferably in the range of 0.1 to 1.2 moles of water per mole of aluminum in the aluminum trichloride.

42. The process according to one of claims 1 to 41, wherein the temperature in step c) is from 10 to 100℃, preferably from 50 to 100℃, more preferably from 60 to 95℃ and even more preferably from 75 to 95℃ .

43. The process according to one of claims 1 to 42, wherein the at least one LCST compound is selected from the group consisting of:

poly(N-isopropylacrylamide), poly(N-isopropylacrylamide-co-N,N-dimethylacrylamide, poly(N-isopropylacrylamide)-alt-2-hydroxyethylmethacrylate, poly(N-vinylcaprolactam), poly(N,N-diethylacrylamide), poly[2-(dimethylamino)ethyl methacrylate], poly(2-oxazoline) glycopolymers, Poly(3-ethyl-N-vinyl-2-pyrrolidone), hydroxylbutyl chitosan, polyoxyethylene (20) sorbitan monostearate, polyoxyethylene (20) sorbitan monolaurate, polyoxyethylene (20) sorbitan monooleate, methyl cellulose, hydroxypropyl cellulose, hydroxyethyl methylcellulose, hydroxyethyl cellulose hydroxypropyl methylcellulose, poly(ethylene glycol) methacrylates with 2 to 6 ethylene glycol units, polyethyleneglycol-co-polypropylene glycols, preferably those with 2 to 6 ethylene glycol units and 2 to 6 polypropylene units, compounds of formula (I)

(I) $HO-[-CH_2-CH_2-O]_x-[-CH(CH_3)-CH_2-O]_y-[-CH_2-CH_2-O]_z-H$

with y = 3 to 10 and x and z = 1 to 8, whereby y+x+z is from 5 to 18,

polyethyleneglycol-co-polypropylene glycol, preferably those with 2 to 8 ethylene glycol units and 2 to 8 polypropylene units, ethoxylated iso-$C_{13}H_{27}$-

alcohols, preferably with an ethoxylation degree of 4 to 8, polyethylene glycol with 4 to 50, preferably 4 to 20 ethyleneglycol units, polypropylene glycol with 4 to 30, preferably 4 to 15 propyleneglycol units, polyethylene glycol monomethyl, dimethyl, monoethyl and diethyl ether with 4 to 50, preferably 4 to 20 ethyleneglycol units, polypropylene glycol monomethyl, dimethyl, monoethyl and diethyl ether with 4 to 50, preferably 4 to 20 propyleneglycol units, whereby methyl cellulose, hydroxypropyl cellulose, hydroxyethyl methylcellulose and hydroxypropyl methylcellulose are preferred.

44. The process according to one of claims 1 to 43, wherein the amount of LCST compound(s) present in the aquous medium employed in step c) is of from 1 to 20,000 ppm, preferably 3 to 10,000 ppm, more preferably 5 to 5,000 ppm and even more preferably 10 to 5,000 ppm with respect to the amount of copolymer present in the medium obtained according to step b).

45. The process according to one of claims 1 to 44, wherein the amount of LCST compound(s) present in the aquous medium employed in step c) is of from 1 to 5,000 ppm, preferably 3 to 1,000 ppm, more preferably 5 to 500 ppm and even more preferably 5 to 100 ppm with respect to the amount of copolymer present in the medium obtained according to step b).

46. The process according to one of claims 1 to 45, wherein the LCST compounds exhibit a molecular weight of at least 1,500 g/mol, preferably at least 2,500 g/mol and more preferably at least 4,000 g/mol.

47. The process according to one of claims 1 to 46, comprising a further step d) wherein the copolymer particles contained in the aqueous slurry obtained according to step c) are separated to obtain isolated copolymer particles.

48. The process according to one of claims 1 to 47, comprising further step d) wherein the copolymer particles contained in the aqueous slurry obtained according to step c) are separated to obtain isolated copolymer particles and further step e) wherein the (isolated) copolymer particles are dried, preferably to a residual content of volatiles of 7,000 or less, preferably 5,000 or less, even more preferably 4,000 or less and in onother embodiment 2,000 ppm or less, preferably 1,000 ppm or less.

49. The process according to one of claims 1 to 48, comprising as a further step shaping of the copolymer particles to obtain reshaped copolymer particles such as pellets or shaped articles such as bales.

50. Aqueous slurry obtainable according to a process according to claims 1 to 49.

51. Copolymer particles obtainable according to a process according to claims 47 or 48.

52. Reshaped copolymer particles obtainable according to a process according to claim 49.

53. Copolymer compositions, in particular reshaped copolymer particles or copolymer particles having a copolymer content of 98.5 wt.-% or more, preferably 98.8 wt.-% or more, more preferably, 99.0 wt.-% or more even more preferably 99.2 wt.-% or more, yet even more preferably 99.4 wt.-% or more and comprising LCST compounds in an amount of from 1 ppm to 5,000 ppm.

54. Copolymer compositions, in particular reshaped copolymer particles or copolymer particles according to claim 53 comprising 550 ppm or less, preferably 400 ppm or less, more preferably 300 ppm or less, even more preferably 250 ppm or less of mono- or multivalent metal ions calculated on their metal content.

55. Copolymer compositions, in particular reshaped copolymer particles or copolymer particles according to claim 53 or 54, comprising 5,000 ppm or less, preferably 2,000 ppm or less, more preferably 1,000 ppm or less, even more preferably 500 ppm or less and yet even more preferably 100 ppm or less non-LCST compounds, whereby the non-LCST compounds are

- selected from the group consisting of ionic or non-ionic surfactants, emulsifiers, and antiagglomerants or are in another embodiment
- salts of (mono- or multivalent) metal ions or are in another embodiment
- carboxylic acid salts of multivalent metal ions or are in another embodiment
- stearates or palmitates of mono- or multivalent metal ions or are in another embodiment
- calcium and zinc stearates or palmitates.

56. Copolymer compositions, in particular reshaped copolymer particles or copolymer particles according to one of claims 53 to 55, comprising salts of

multivalent metal ions in an amount of of 500 ppm or less, preferably 400 ppm or less, more preferably 250 ppm or less, even more preferably 150 ppm or less and yet even more preferably 100 ppm or less and in an even more preferred embodiment 50 ppm or less calculated on their metal content.

57. Copolymer compositions, in particular reshaped copolymer particles or copolymer particles according to one of claims 53 to 56, comprising antioxidants such as 2,6-di-tert.-butyl-4-methyl-phenol (BHT) and pentaerythrol-tetrakis-[3-(3,5-di-tert.-butyl-4-hydroxyphenyl)-propanoic acid (also known as Irganox® 1010), preferably in an amount of from 50 ppm to 1000 ppm, more preferably of from 80 ppm to 500 ppm.

58. Copolymer compositions, in particular reshaped copolymer particles or copolymer particles according to one of claims 53 to 57, comprising LCST compounds in an amount of from 1 ppm to 2,000 ppm.

59. Copolymer compositions, in particular reshaped copolymer particles or copolymer particles according to one of claims 53 to 58, comprising LCST compounds in an amount of from 5 ppm to 100 ppm, preferably from 5 to 50 ppm and more preferably from 5 to 30 ppm.

60. Copolymer compositions, in particular reshaped copolymer particles or copolymer particles according to one of claims 53 to 59, comprising salts of monovalent metal ions in an amount of from 10 to 200 ppm.

61. Copolymer compositions, in particular reshaped copolymer particles or copolymer particles according to one of claims 53 to 60, comprising stearates or palmitates of multivalent metal ions in an amount of from 0 to 4,000 ppm, preferably 0 to 2,000 ppm, more preferably 0 to 1,000 ppm and in a more preferred embodiment from 0 to 500 ppm.

62. Copolymer compositions, in particular reshaped copolymer particles or copolymer particles comprising

I) 100 parts by weight of a copolymer

II) 0.0001 to 0.5, preferably 0.0001 to 0.2, more preferably 0.0005 to 0.1, even more preferably 0.0005 to 0.05 parts by weight of a least one LCST compound and

III) no or from 0.0001 to 0.4, preferably no or from 0.0001 to 0.2, more preferably no or from 0.0001 to 0.1, even more preferably no or from

0.0001 to 0.05, yet even more preferably no or from 0.0001 to 0.01, and most preferably no or from 0.0001 to 0.003 parts by weight of non-LCST compounds, whereby the non-LCST compounds are

- selected from the group consisting of ionic or non-ionic surfactants, emulsifiers, and antiagglomerants

IV) no or from 0.005 to 0.3, preferably 0.05 to 0.1, more preferably from 0.008 to 0.05 and yet more preferably from 0.03 to 0.07 parts by weight of antioxidants

V) from 0.005 to 1.5, preferably 0.05 to 1.0, more preferably 0.005 to 0.5, even more preferably from 0.01 to 0.3 and yet even more preferably from 0.05 to 0.2 parts by weight of volatiles having a boiling point at standard pressure of 200℃ or less

whereby, in a preferred embodiment the aforementioned components I) to V) add up to 100.00501 to 102.700000 parts by weight, preferably 100.00501 to 101.500000 parts by weight, more preferably from 100.01 to 101.00 parts by weight, even more preferably from 100.10 to 100.80 parts by weight, yet even more preferably from 100.10 to 100.60 parts by weight and

together represent 99.50 to 100.00 wt.-%, or in another embodiment, 99.80 to 100.00 wt.-%, preferably 99.90 to 100.00 wt.-%, more preferably 99.95 to 100.00 wt.-% and yet even more preferably 99.97 to 100.00 wt.-% of the total weight of the copolymer compositions, in particular reshaped copolymer particles or copolymer particles.

63. Copolymer compositions in particular reshaped copolymer particles or copolymer particles comprising

I) 96.0 wt.-% or more, preferably 97.0 wt.-% or more, more preferably, 98.0 wt.-% or more even more preferably 99.0 wt.-% or more, yet even more preferably 99.2 wt.-% or more of a copolymer and

II) 1 ppm to 5,000 ppm, preferably from 1 ppm to 2,000 ppm of at least one LCST compound,

whereby the copolymer compositions further have an ash content measured according to ASTM D5667 of 0.25 wt.-% or less, preferably 0.15 wt.-% or less, more preferably 0.10 wt.-% or less and even more preferably 0.05 wt.-% or less.

64. Copolymer compositions in particular reshaped copolymer particles or copolymer particles comprising

I) 100 parts by weight of a copolymer (phr)

II) 0.0001 to 0.5, preferably 0.0001 to 0.2, more preferably 0.0005 to 0.1, even more preferably 0.0005 to 0.05 parts by weight (phr) of a least one LCST compound and

III) no or from 0.005 to 0.3, preferably 0.005 to 0.1, more preferably from 0.008 to 0.05, even more preferably from 0.03 to 0.07 parts by weight (phr) of antioxidants

IV) from 0.005 to 1.5, preferably 0.05 to 1.0, more preferably 0.005 to 0.5, even more preferably from 0.01 to 0.3 and yet more preferably from 0.05 to 0.2 parts by weight (phr) of volatiles having a boiling point at standard pressure of 200℃ or less

whereby the copolymer compositions further have an ash content measured according to ASTM D5667 of 0.25 wt.-% or less, preferably 0.15 wt.-% or less, more preferably 0.10 wt.-% or less and even more preferably 0.05 wt.-% or less.

65. Copolymer compositions in particular reshaped copolymer particles or copolymer particles according to claim 64 wherein components I) to IV) add up to 100.00501 to 102.300000 parts by weight and together represent 99.00 to 100.00 wt.-% of the total weight of the copolymer composition.

66. Use of LCST compounds having a cloud point of 0 to 100℃, preferably 5 to 100℃, more preferably 15 to 80℃ and even more pre ferably 20 to 70℃ as anti-agglomerant, in particular for copolymer compositions, in particular reshaped copolymer particles or copolymer particles, preferably for those defined in claims 53 to 65.

67. Shaped article, in particular a pellet or bale obtainable by shaping copolymer particles according to claims 53 to 65.

68. Blends or compounds obtainable by blending or compounding the copolymer compositions, in particular reshaped copolymer particles or copolymer particles according to claims 53 to 65 or the shaped articles of claim 67.

69. Blends or compounds comprising copolymer compositions according to claims 53 to 65, whereby the blends comprise a ratio of copolymer to carboxylic acid salts of mono- and multivalent metal ions of at least 250:1, preferably at least 500:1, more preferably at least 1000:1 any yet even more preferably at least 2000:1.

70. Use of the copolymer compositions, in particular reshaped copolymer particles or copolymer particles according to claims 53 to 65 or the shaped articles of claim 67 or the blends and compounds of claims 68 and 69 for innerliners, bladders, tubes, air cushions, pneumatic springs, air bellows, accumulator bags, hoses, power belts, conveyor belts and pharmaceutical closures, automobile suspension bumpers, auto exhaust hangers, body mounts, shoe soles, tire sidewalls and tread compounds, belts, hoses, shoe soles, gaskets, o-rings, wires/cables, membranes, rollers, bladders (e.g. curing bladders), inner liners of tires, tire treads, shock absorbers, machinery mountings, balloons, balls, golf balls, protective clothing, medical tubing, storage tank linings, electrical insulation, bearings, pharmaceutical stoppers, adhesives, a container, such as a bottle, tote, storage tank, a container closure or lid; a seal or sealant, such as a gasket or caulking; a material handling apparatus, such as an auger or conveyor belt; a cooling tower; a metal working apparatus, or any apparatus in contact with metal working fluids; an engine component, such as fuel lines, fuel filters, fuel storage tanks, gaskets, seals, etc.; a membrane, for fluid filtration or tank sealing, appliances, baby products, bathroom fixtures, bathroom safety, flooring, food storage, garden, kitchen fixtures, kitchen products, office products, pet products, sealants and grouts, spas, water filtration and storage, equipment, food preparation surfaces and equipments, shopping carts, surface applications, storage containers, footwear, protective wear, sporting gear, carts, dental equipment, door knobs, clothing, telephones, toys, catheterized fluids in hospitals, surfaces of vessels and pipes, coatings, food processing, biomedical devices, filters, additives, computers, ship hulls, shower walls, tubing, pacemakers, implants, wound dressing, medical textiles, ice machines, water coolers, fruit juice dispensers, soft drink machines, piping, storage vessels, metering systems, valves, fittings, attachments, filter housings, linings, and barrier coatings.

71. Innerliners, bladders, tubes, air cushions, pneumatic springs, air bellows, accumulator bags, hoses, conveyor belts, power belts and pharmaceutical

closures, automobile suspension bumpers, auto exhaust hangers, body mounts, shoe soles, tire sidewalls and tread compounds, belts, hoses, shoe soles, gaskets, o-rings, wires/cables, membranes, rollers, bladders (e.g. curing bladders), inner liners of tires, tire treads, shock absorbers, machinery mountings, balloons, balls, golf balls, protective clothing, medical tubing, storage tank linings, electrical insulation, bearings, pharmaceutical stoppers, adhesives, a container, such as a bottle, tote, storage tank, a container closure or lid; a seal or sealant, such as a gasket or caulking; a material handling apparatus, such as an auger or conveyor belt; a cooling tower; a metal working apparatus, or any apparatus in contact with metal working fluids; an engine component, such as fuel lines, fuel filters, fuel storage tanks, gaskets, seals, etc.; a membrane, for fluid filtration or tank sealing, appliances, baby products, bathroom fixtures, bathroom safety, flooring, food storage, garden, kitchen fixtures, kitchen products, office products, pet products, sealants and grouts, spas, water filtration and storage, equipment, food preparation surfaces and equipments, shopping carts, surface applications, storage containers, footwear, protective wear, sporting gear, carts, dental equipment, door knobs, clothing, telephones, toys, catheterized fluids in hospitals, surfaces of vessels and pipes, coatings, food processing, biomedical devices, filters, additives, computers, ship hulls, shower walls, tubing, pacemakers, implants, wound dressing, medical textiles, ice machines, water coolers, fruit juice dispensers, soft drink machines, piping, storage vessels, metering systems, valves, fittings, attachments, filter housings, linings, and barrier coatings made from or comprising copolymer compositions, in particular reshaped copolymer particles or copolymer particles according to claims 53 to 65 or the shaped articles of claim 67 or the blends and compounds of claims 68 and 69.

72. Sealants in particular window sealant comprising

- from 0.1 to 60 wt.-%, preferably of from 0.5 to 40 wt.-%, more preferably of from 5 to 30 wt.-% and more preferably of from 15 to 30 wt.-% of of at least one copolymer composition according to claims 53 to 65,
- from 0.1 to 40 wt.-%, preferably of from 10 to 30 wt.-%, more preferably of from 10 to 25 wt.-% of at least one filler
- from 0.1 to 30 wt.-%, preferably of from 10 to 30 wt.-%, more preferably of from 15 to 25 wt.-% of at least one secondary rubber

- from 0.01 to 2 wt.-%, preferably of from 0.1 to 1 wt.-%, more preferably of from 0.1 to 0.8 wt.-% of at least one anti-oxidant
- zero, or from 0.01 to 30 wt.-%, preferably of from 10 to 30 wt.-%, more preferably of from 15 to 25 wt.-% of at least one non-crystalline thermoplastic

whereby the sealant in particular the window sealant comprises a ratio of copolymer to carboxylic acid salts of mono- and multivalent metal ions of at least 250:1, preferably at least 500:1, more preferably at least 1000:1 any yet even more preferably at least 2000:1 and whereby the aforementioned components are selected such that they add up to 80 to 100 % of the total weight of the sealant or the window sealant, preferably to 80 to 100 wt.-% and more preferably to 95 to 100 wt.-%.