Claims:

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

A) contacting an organic medium comprising

i) at least one elastomer and

ii) an organic diluent

with an aqueous medium comprising at least one LCST compound 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 70°C and

B) removing at least partially the organic diluent to obtain the aqueous slurry comprising the elastomer particles.

2. A Process for the preparation of an aqueous slurry comprising a plurality of elastomer particles suspended therein, the process comprising at least the step of:

A) contacting an organic medium comprising.

i) at least one elastomer and

ii) an organic diluent.

with an aqueous medium comprising at least one compound selected from the group consisting of alkylcelluloses, hydroxyalkyl celluloses, hydroxyalkyl alkyl celluloses and carboxyalkylcelluloses, preferably alkylcelluloses, hydroxyalkylcelluloses and hydroxyalkyl alkyl celluloses and

B) removing at least partially the organic diluent to obtain the aqueous slurry comprising the elastomer particles.

3. The process according to claim 1 or 2, wherein the elastomers include butyl rubbers and halogenated butyl rubbers, polyisobutylene, ethylene propylene diene M class rubbers (EPDM), nitrile butadiene rubbers (NBR), hydrogenated nitrile butadiene rubbers (HNBR) and styrene butadiene rubbers (SBR).

4. The process according to claim 1, 2 or 3, wherein the organic medium comprising at least one elastomer and an organic diluent is obtained from a polymerization reaction or a post polymerization reaction such as halogenation.

5. The process according to one of claims 1 to 4, wherein the organic medium is obtained from a polymerization reaction and further contains residual monomers of the polymerization reaction.

6. process according to one of claims 1 to 5, wherein the aqueous medium furthers contain 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

7. The process according to one of claims 1 to 6, wherein the aqueous medium comprises 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 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 five groups listed in claim 6.

8. The process according to one of claims 1 to 7, wherein the aqueous medium comprises 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 five groups listed in claim 6.

9. The process according to one of claims 1 to 8, wherein the aqueous medium comprises of from 0 to 5,000 ppm, preferably of from 0 to 2,000 ppm, more preferably of from 10 to 1,000 ppm, even more preferably of from 50 to 800 ppm and yet even more preferably of from 100 to 600 ppm of salts of mono or

~~multivalent metal ions calculated on their metal content and with respect to the amount of elastomer present in the organic medium.~~

~~10. The process according to one of claims 1 to 9, wherein the aqueous medium comprises of from 0 to 5,000 ppm, preferably of from 0 to 2,000 ppm, more preferably of from 10 to 1,000 ppm, even more preferably of from 50 to 800 ppm and yet even more preferably of from 100 to 600 ppm of salts of multivalent metal ions calculated on their metal content and with respect to the amount of elastomer present in the organic medium.~~

~~11. The process according to one of claims 1 to 10, wherein the weight ratio of salts of stearates, palmitates and oleates of mono- and multivalent metal ions to the LCST compounds is of from 1:2 to 1:100, preferably 1:2 to 1:10 and more preferably of from 1:5 to 1:10 in the aqueous medium.~~

~~12. The process according to one of claims 1 to 11, wherein the aqueous medium comprises 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 elastomer present in the organic medium.~~

~~13. The process according to one of claims 1 to 12, wherein the aqueous medium comprises 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 elastomer present in the organic medium.~~

~~14. The process according to one of claims 1 to 13, wherein the aqueous medium comprises 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, in another embodiment preferably 500 ppm or less, more preferably 100 ppm or less and even more preferably 15 ppm or less and yet even more preferably no or from 1 ppm to 10 ppm of non-ionic surfactants being non LCST compounds whereby the non LCST compounds are selected from the five groups listed in claim 6 and with respect to the amount of elastomer present in the organic medium.~~

~~15. The process according to one of claims 1 to 14, 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 elastomer present in the organic medium.~~

~~16. The process according to one of claims 1 to 15, 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 elastomer present in the organic medium.~~

~~17. The process according to one of claims 1 to 16, wherein the aqueous medium comprises 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 elastomer present in the organic medium, 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 mediumcomprises 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 elastomer present in the organic medium, 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.~~

~~19. The process according to one of claims 1 to 18, 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 elastomer present in the organic medium, 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.~~

~~20. The process according to one of claims 1 to 19, wherein the aqueous medium one embodiment 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.~~

~~21. The process according to one of claims 1 to 20, 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 elastomer present in the organic medium.~~

~~22. The process according to one of claims 1 to 21, wherein the aqueous medium comprises additionally or alternatively 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 such as sodium stearate, sodium palmitate and sodium oleate and potassium stearate, potassium palmitate and potassium oleate calculated on their metal content and with respect to the amount of elastomer present in the organic medium, 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. In one embodiment such carboxylic acids are selected from monocarboxylic acids.~~

~~23. The process according to one of claims 1 to 22, 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.~~

~~24. The process according to one of claims 17 to 23, wherein the carboxylic acids are selected from monocarboxylic acids, preferably saturated monocarboxylic acids, more preferably palmitic or stearic acid.~~

~~25. The process according to one of claims 1 to 24, wherein the aqueous medium comprises of from 0 to 5,000 ppm, preferably of from 0 to 2,000 ppm, more~~

preferably of from 10 to 1,000 ppm, even more preferably of from 50 to 800 ppm and yet even more preferably of from 100 to 600 ppm of

- carbonates of multivalent metal ions calculated on their metal content and with respect to the amount of elastomer present in the organic medium or in another embodiment of
- magnesium carbonate and calcium carbonate calculated on their metal content and with respect to the amount of elastomer present in the organic medium.

26. The process according to one of claims 1 to 25, wherein the aqueous medium comprises 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

- carbonates of multivalent metal ions calculated on their metal content and with respect to the amount of elastomer present in the organic medium or in another embodiment of
- magnesium carbonate and calcium carbonate calculated on their metal content

and with respect to the amount of elastomer present in the organic medium.

27. The process according to one of claims 1 to 26, 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

- carbonates of multivalent metal ions calculated on their metal content and with respect to the amount of elastomer present in the organic medium or in another embodiment of
- magnesium carbonate and calcium carbonate calculated on their metal content

and with respect to the amount of elastomer present in the organic medium.

28. The process according to one of claims 1 to 27, 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 elastomer present in the organic medium.~~

~~29. The process according to one of claims 1 to 28, 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 LCST compounds.~~

~~30. The process according to one of claims 1 to 29, wherein elastomer 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.~~

~~31. The process according to one of claims 1 to 30, wherein elastomer particles have a weight average particle size of from 0.3 to 10.0 mm.~~

~~32. The process according to one of claims 1 to 31, wherein 90 wt.% or more of the elastomer particles have a size of between 12.50 mm and 1.6 mm and 80 wt.% or more of the elastomer particles have a size of between 8.00 mm and 3.35 mm as determined by sieving.~~

~~33. The process according to one of claims 1 to 32, wherein the aqueous phase 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 elastomer present in the organic medium.~~

~~34. The process according to one of claims 1 to 33, wherein the weight average molecular weight of the elastomer is in the range of from 10 to 2,000 kg/mol, preferably in the range of from 20 to 1,000 kg/mol, more preferably in the range of from 50 to 1,000 kg/mol, even more preferably in the range of from 200 to 800 kg/mol, yet more preferably in the range of from 375 to 550 kg/mol, and most preferably in the range of from 400 to 500 kg/mol.~~

~~35. The process according to one of claims 1 to 34, wherein the number averaged molecular weight (M_n) of the elastomer is in the range of from 5 to 1100 kg/mol, preferably in the range of from 80 to 500 kg/mol.~~

~~36. The process according to one of claims 1 to 35, wherein the elastomer has a polydispersity of the elastomers according to the invention is in the range of 1.1 to 6.0, preferably in the range of 1.5 to 4.5 as measured by the ratio of weight~~

~~average molecular weight to number average molecular weight as determined by gel permeation chromatography.~~

~~37. The process according to one of claims 1 to 36, wherein the elastomer has a Mooney viscosity of at least 10 (ML 1 + 8 at 125°C, ASTM D 1646), preferably of from 10 to 80, more preferably of from 20 to 80 and even more preferably of from 25 to 60 (ML 1 + 8 at 125°C, ASTM D 1646).~~

~~38. The process according to one of claims 1 to 37, wherein the organic medium is obtained by a process comprising at least the steps of:~~

~~a) providing a reaction medium comprising an organic diluent, and at least one polymerizable monomer~~

~~b) polymerizing the monomers within the reaction medium in the presence of an initiator system or catalyst to form an organic medium comprising the elastomer, the organic diluent and optionally residual monomers.~~

~~39. The process according to one of claims 1 to 38, wherein the organic medium is obtained by a 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 an organic medium comprising the elastomer, the organic diluent and optionally residual monomers.~~

~~40. The process according to one of claim 39, 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.~~

~~41. The process according to one of claims 39 to 40, wherein the isoolefin is isobutene.~~

~~42. The process according to one of claims 39 to 41, 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.~~

~~43. The process according to one of claims 39 to 42, wherein the multiolefin is isoprene.~~

~~44. The process according to one of claims 39 to 43, wherein the monomers are isobutylene and isoprene.~~

~~45. The process according to one of claims 39 to 44, 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.~~

~~46. The process according to one of claims 39 to 45, 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.~~

~~47. The process according to one of claims 39 to 46, 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.~~

~~48. The process according to one of claims 39 to 47, 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. The isoolefin is preferably isobutene and the multiolefin is preferably isoprene.~~

~~49. The process according to one of claims 39 to 48, 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.-%.~~

~~50. The process according to one of claims 1 to 49, 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-dimethylpentane, 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-dimethylcyclopentane, cis-1,2-dimethylcyclopentane, trans-1,2-dimethylcyclopentane, trans-1,3-dimethylcyclopentane, ethylcyclopentane, cyclohexane, methylcyclohexane mixtures of the aforementioned diluents.~~

~~51. The process according to one of claims 39 to 50, wherein the polymerization according to step b) is carried out either as slurry polymerization or solution polymerization.~~

~~52. The process according to one of claims 39 to 51, wherein step b) is carried out batchwise or continuously, preferably continuously.~~

~~53. The process according to one of claims 39 to 52, wherein the polymerization according to step b) is carried out as slurry polymerization and 80 % of the particles obtained during slurry polymerization have a size of about 0,1 to about 800 µm, preferably about 0.25 to about 500 µm.~~

~~54. The process according to any one of claim 1 to 53 wherein 50 wt.% or more, preferably 60 wt.% or more, more preferably 70 wt.% or more, or 80 wt.% or more of the elastomer particles have a particle size between about 3.35 mm and 8.00 mm.~~

55. The process according to any one of claim 1 to 54, wherein in a sieving experiment having 6 sieves with opening between of about 19.00 mm, about 12.50 mm, about 8.00 mm, about 6.30mm, about 3.35 mm and about 1.60 mm, about 50 wt.% or more, 60 wt.% or more, 70 wt.% or more, or 80 wt.% or 90 wt% or more of the elastomer particles are found in the sieves between about 8.00 mm and about 3.35 mm (inclusive).

56. The process according to one of claims 1 to 55, wherein diluent removal is effected within a timeframe of 0.1 s to 30 s, preferably within 0.5 to 10 s.

57. The process according to one of claims 1 to 56, wherein the removal of the organic diluent is performed such that the aqueous slurry comprises less than 10 wt. % of organic diluent calculated on the elastomer contained in the elastomer particles of the resulting aqueous slurry, preferably less than 7 wt. % and even more preferably less than 5 wt. % and yet even more preferably less than 3 wt. % and still yet even more preferably less than 1 wt % within a timeframe of 0.1 s to 30 s, preferably within 0.5 to 10 s.

58. The process according to one of claims 39 to 57, wherein the initiator comprises aluminium trichloride, preferably in a wt. ratio of isobutylene to aluminum trichloride of 500 to 20000, preferably 1500 to 10000.

59. The process according to claim 58, 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.

60. The process according to one of claims 1 to 59, wherein the temperature in step A) is from 10 to 100°C, preferably from 50 to 100°C, more preferably from 60 to 95°C and even more preferably from 75 to 95°C.

61. The process according to one of claims 1 to 60, 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, 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.~~

~~62. The process according to any one of claims 1 to 61, wherein LCST compounds are selected from the group consisting of cellulose compounds in which at least one of the hydroxyl functions –OH of the cellulose is functionalized to form on of the following groups:~~

~~$-OR^c$ with R^c being methyl, 2 hydroxyethyl, 2 methoxyethyl, 2 methoxypropyl, 2 hydroxypropyl, $-(CH_2-CH_2O)_nH$, $-(CH_2-CH_2O)_nCH_3$, $-(CH_2-CH(CH_3)O)_nH$, $-(CH_2-CH(CH_3)O)_nCH_3$ with n being an integer from 1 to 20, preferably from 3 to 20.~~

~~63. The process according to any one of claims 1 to 62, wherein the alkylcellulose, hydroxyalkylcelluloses, and carboxyalkylcelluloses have a degree of substitution (DS) from 0.5 to 2.8, preferably from 1.2 to 2.5.~~

~~64. The process of any one of claims 1 and 3 to 63, wherein the LCST compound is selected from the group consisting of methyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, hydroxyethyl methylcellulose, hydroxypropyl methylcellulose or a combination thereof.~~

~~65. The process of any one of claims 2 to 64, wherein the cellulose is selected from the group consisting of methyl cellulose, hydroxyethyl cellulose, hydroxypropyl~~

~~cellulose, hydroxyethyl methylcellulose, hydroxypropyl methylcellulose or a combination thereof.~~

~~66. The process according to one of claims 1 to 65, wherein the amount of LCST compound(s) present in the aqueous medium employed in step A) 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 elastomer present in the organic medium.~~

~~67. The process according to one of claims 1 to 66, wherein the amount of LCST compound(s) present in the aqueous medium employed in step A) 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 elastomer present in the organic medium.~~

~~68. The process according to one of claims 1 to 67, 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.~~

~~69. The process of any one claims 1 or 3 to 68, wherein the weight average molecular weight of the LCST compounds is from about 1500 to 3000000, preferably from 1500 to 2600000~~

~~70. The process according to one of claims 1 to 69, comprising a further step C) wherein the elastomer particles contained in the aqueous slurry obtained according to step B) are separated to obtain isolated elastomer particles.~~

~~71. The process according to one of claims 1 to 70, comprising further step C) wherein the elastomer particles contained in the aqueous slurry obtained according to step B) are separated to obtain isolated elastomer particles and further step c) wherein the (isolated) elastomer 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 another embodiment 2,000 ppm or less, preferably 1,000 ppm or less.~~

~~72. The process according to one of claims 1 to 71, comprising as a further step shaping of the elastomer particles to obtain reshaped elastomer particles such as pellets or shaped articles such as bales.~~

~~73. Aqueous slurry obtainable according to a process according to claims 1 to 72.~~

~~74. Elastomer particles obtainable according to a process according to claims 70 or 71.~~

~~75. Reshaped elastomer particles obtainable according to a process according to claim 72.~~

~~76. Elastomer compositions, in particular reshaped elastomer particles or elastomer 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 and in another embodiment 99.5 wt.-% or more of a elastomer~~

~~II) 0 to 3.0 wt.-%, preferably 0 to 2.5 wt. %, more preferably 0 to 1.0 wt.-% and more preferably 0 to 0,40 wt.-% of salts of mono- or multivalent metal ions, prefably stearates and palmitates of multivalent metal ions and~~

~~III) 1 ppm to 5,000 ppm, preferably from 1 ppm to 2,000 ppm and in a more preferred embodiment from 5 to 1,000 ppm or from 5 to 500 ppm of at least one LCST compound.~~

~~77. Elastomer compositions, in particular reshaped elastomer particles or elastomer particles comprising~~

~~I) 100 parts by weight of a elastomer~~

~~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 3.0, preferably no or from 0.0001 to 2.0, more preferably no or from 0.0001 to 1.0, even more preferably no or from 0.0001 to 0.5, yet even more preferably no or from 0.0001 to 0.3, and most preferably no or from 0.0001 to 0.2 parts by weight of salts of mono or multivalent metal ions, prefably stearates and palmitates of mono- or multivalent metal ions, preferably comprising calcium stearate, calcium palmitate, zinc stearate or zinc palmitate and~~

~~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°C or less.

78. Elastomer compositions, in particular reshaped elastomer particles according to claim 75 or elastomer particles according to claim 74 wherein the components I) to V) add up to to100.00501 to 105.300000 parts by weight (phr), preferably 100.00501 to 104.100000 parts by weight (phr), more preferably from 100.01 to 103.00 parts by weight, even more preferably from 100.10 to 101.50 parts by weight, yet even more preferably from 100.10 to 100.80 parts by weight and together represent 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 elastomer compositions, in particular reshaped elastomer particles or elastomer particles.

79. Elastomer compositions, in particular reshaped elastomer particles or elastomer particles according to one of claims 74 to 78, whereby the elastomers comprise repeating units derived from at least one isoolefin and at least one multiolefin.

80. Elastomer compositions, in particular reshaped elastomer particles or elastomer particles according to one of claims 74 to 79, whereby the elastomers comprise repeating units derived from isobutylene and isoprene.

81. Elastomer compositions, in particular reshaped elastomer particles or elastomer particles according to one of claims 74 to 80, whereby the elastomers consist of repeating units derived from isobutylene and isoprene.

82. Reshaped elastomer particles or elastomer particles according to one of claims 74 to 81, whereby the elastomers have a multiolefin content of 0.1 mol % or more, preferably of from 0.1 mol-% to 15 mol %, in another embodiment 0.5 mol-% or more, preferably of from 0.5 mol-% to 10 mol %, in another embodiment 0.7 mol-% or more, preferably of from 0.7 to 8.5 mol % in particular of from 0.8 to 1.5 or from 1.5 to 2.5 mol-% or of from 2.5 to 4.5 mol % or from 4.5 to 8.5 mol-%, particularly where isobutene and isoprene are employed.

83. Elastomer compositions, in particular reshaped elastomer particles or elastome particles according to one of claims 74 to 82, wherein the multiolefin content of elastomers is 0.001 mol-% or more, preferably of from 0.001 mol-% to 3 mol-%, particularly where isobutene and isoprene are employed.

84. Elastomer compositions, in particular reshaped elastomer particles or elastomer particles according to one of claims 74 to 83, wherein the weight average molecular weight of the elastomer is in the range of from 10 to 2,000 kg/mol, preferably in the range of from 20 to 1,000 kg/mol, more preferably in the range of from 50 to 1,000 kg/mol, even more preferably in the range of from 200 to 800 kg/mol, yet more preferably in the range of from 375 to 550 kg/mol, and most preferably in the range of from 400 to 500 kg/mol.

85. Elastomer compositions, in particular reshaped elastomer particles or elastomer particles according to one of claims 74 to 84, wherein the polydispersity of the elastomers is in the range of 1.1 to 6.0, preferably 1.5 to 4.5 as measured by the ratio of weight average molecular weight to number average molecular weight as determined by gel permeation chromatography.

86. Elastomer compositions, in particular reshaped elastomer particles or elastomer particles according to one of claims 74 to 85, wherein the number averaged molecular weight (M_n) of the polyisobutylene is in the range of from 5 – 1100 kg/mol, preferably in the range of from 80 to 500 kg/mol.

87. Elastomer compositions, in particular reshaped elastomer particles or elastomer particles according to one of claims 74 to 86, wherein the elastomer has a Mooney viscosity of at least 10 (ML 1 + 8 at 125°C, ASTM D 1646-07 (2012)), preferably of from 10 to 80, more preferably of from 20 to 80 and even more preferably of from 25 to 60 (ML 1 + 8 at 125°C, ASTM D 1646-07 (2012)).

88. Elastomer compositions, in particular reshaped elastomer particles according to one of claims 74 to 87, whereby they are or form a pellet or a shaped article, preferably a bale.

89. Shaped article, in particular a pellet or bale obtainable by shaping elastomer compositions, in particular reshaped elastomer particles according to claims 74 to 88.

90. Blends or compounds obtainable by blending or compounding the elastomer particles or reshaped elastomer particles according to claims 74 to 88 or the shaped articles of claim 89.

91. Blends or compounds comprising elastomer compositions according to one of claims 76 to 88, whereby the blends comprise a ratio of elastomer 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.~~

~~92. Use of the elastomer compositions, in particular reshaped elastomer particles or reshaped elastomer particles according to claims 74 to 88 or the shaped articles of claim 89 or the blends and compounds of claims 90 and 91 for innerliners, bladders, tubes, air cushions, pneumatic springs, air bellows, accumulator bags, hoses, 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.~~

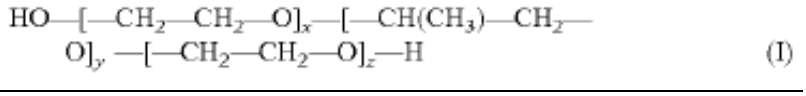
~~93. Innerliners, bladders, tubes, air cushions, pneumatic springs, air bellows, accumulator bags, hoses, conveyor belts and pharmaceutical closures, automobile suspension bumpers, auto exhaust hangers, body mounts, shoe soles, tire sidewalls and tread compounds, belts, hoses, shoe soles, gaskets, o-rings, 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. Additional examples where the butyl ionomers may be used in articles or coatings include, but are not limited to, the following: 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 elastomer compositions, in particular reshaped elastomer particles or reshaped elastomer particles according to claims 74 to 88 or the shaped articles of claim 89 or the blends and compounds of claims 90 and 91.~~

~~94. Use of sulfur based curing system, resin cure systems and peroxide based curing systems and their specific components singly and jointly for curing blends or compounds according to claims 90 and 91.~~

1. A process for the preparation of an aqueous slurry comprising a plurality of elastomer particles suspended therein, the process comprising:
polymerizing monomers comprising at least one isoolefin and at least one multiolefin in a reaction medium comprising an organic diluent and an initiator system to form an organic medium comprising:
i) at least one elastomer, and
ii) the organic diluent;
contacting the organic medium with an aqueous medium comprising at least one lower critical solution temperature (LCST) compound, and
removing at least a portion of the organic diluent to obtain an aqueous slurry comprising elastomer particles.

2. The process according to claim 1, wherein the at least one LCST compound is selected from the group consisting of: poly(N-isopropylacrylamide), poly(N-isopropyacrylamide-co-N,N-dimethylacrylamide, poly(N-isopropylacrylamide)-alt-2-hydroxyethytmethacrylate, 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, hydroxypropyl methylcellulose, poly(ethylene glycol) methacrylates with 2 to 6 ethylene glycol units, polyethyleneglycol-co-polypropylene glycols, compounds of formula (I)



$$HO—[—CH_2—CH_2—O]_x—[—CH(CH_3)—CH_2—O]_y—[—CH_2—CH_2—O]_z—H \quad (I)$$

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

with 2 to 8 ethylene glycol units and 2 to 8 polypropylene units, ethoxylated Iso-$C_{13}H_{27}$-alcohols, polyethylene glycol with 4 to 50 ethyleneglycol units, polypropylene glycol with 4 to 30 propyleneglycol units, polyethylene glycol monomethyl, dimethyl, monoethyl and diethyl ether with 4 to 50 ethyleneglycol units, polypropylene glycol monomethyl, dimethyl, monoethyl and diethyl ether with 4 to 50 propyleneglycol units.

3. The process according to claim 1, wherein:

the elastomers are selected from the group consisting of butyl rubbers, halogenated butyl rubbers, polyisobutylene, ethylene propylene diene M-class rubbers (EPDM), nitrile butadiene rubbers (NBR), hydrogenated nitrile butadiene rubbers (HNBR), and styrene-butadiene rubbers (SBR); and

the at least one LCST compound comprises a cellulose selected from the group consisting of alkylcelluloses, hydroxyalkyl celluloses, hydroxyalkyl alkyl celluloses and carboxyalkylcelluloses.

4. The process according to claim 1, wherein the aqueous medium further comprises non-LCST compounds selected from the group consisting of:

ionic and non-ionic surfactants, emulsifiers, and antiagglomerants,

salts of mono- and multivalent metal ions,

carboxylic acid salts of multivalent metal ions, stearates and palmitates of mono- and multivalent metal ions, and

calcium and zinc stearates and palmitates.

5. The process according to claim 1, wherein the weight average molecular weight of the elastomer is 10 to 2,000 kg/mol.

6. The process according to claim 1, wherein the elastomer has a polydispersity of elastomers of 1.1 to 6.0, as measured by the ratio of weight average molecular weight to number average molecular weight as determined by gel permeation chromatography.

7. A process for preparing an aqueous slurry comprising a plurality of elastomer particles suspended therein, the process comprising:

contacting an organic medium comprising:

an elastomer having a Mooney viscosity of at least 10 (ML 1+8 at 125° C., ASTM D 1646), and

an organic diluent,

with an aqueous medium comprising a lower critical solution temperature (LCST) compound, wherein the LCST compound is a cellulose having a cloud point of 0 to 100° C.; and

removing at least a portion of the organic diluent to obtain an aqueous slurry comprising elastomer particles.

8. The process according to claim 1, wherein:

the elastomer comprises a polymer of:

at least one isoolefin selected from the group consisting of isoolefin monomers having from 4 to 16 carbon atoms; and

at least one multiolefin selected from 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;

the organic diluent comprises at least one of: hydrochlorocarbons, hydrofluorocarbons, hydrochlorofluorocarbons, and hydrocarbons; and

the LCST compounds are LCST compounds having a cloud point of 20 to 70° C.

9. The process according to claim 1, wherein:

the elastomer comprises a polymer of isobutylene and isoprene; and

the at least one LCST compound is a cellulose in which at least one of the hydroxyl functions --OH Is functionalized to form one of the following groups: OR^c with R^c being methyl, 2-hydroxyethyl, 2-methoxyethyl, 2-methoxypropyl, 2-hydroxypropyl, $--(CH_2--CH_2O)_nH$, $--(CH_2--CH_2O)_nCH_3$, $--(CH_2--CH(CH_3)O)_nH$, $--(CH_2--CH(CH_3)O)_nCH_3$ with n being an integer from 1 to 20.

10. A process for the preparation of elastomer particles, the process comprising:

A) contacting an organic medium comprising:

i) at least one elastomer, and

ii) an organic diluent

with an aqueous medium comprising at least one lower critical solution temperature (LCST) compound selected from the group consisting of alkylcelluloses, hydroxyalkyl celluloses, hydroxyalkyl alkyl celluloses and carboxyalkycelluloses, and

B) removing at least a portion of the organic diluent to obtain an aqueous slurry comprising elastomer particles,

C) separating the elastomer particles contained in the aqueous slurry to obtain isolated elastomer particles, and

D) drying the Isolated elastomer particles.

11. Elastomer particles obtained according to the process according to claim 10.

12. The elastomer particles according to claim 11, wherein the particles comprise:

I) 96.0 wt. % or more of the elastomer,

II) 0 to 3.0 wt. % of salts of mono- or multivalent metal ions; and

III) 1 ppm to 5,000 ppm of the at least one LCST compound, and the LCST compound has a cloud point of 0 to 100° C.

13. The elastomer particles according to claim 11, wherein the particles comprise:

I) 100 parts by weight of the elastomer;

II) 0.0001 to 0.5 parts by weight of the at least one LCST compound;

III) none or 0.0001 to 3.0 parts by weight of salts of mono- or multivalent metal ions;

IV) none or 0.005 to 0.3 parts by weight of antioxidants; and

V) 0.005 to 1.5 parts by weight of volatiles having a boiling point at standard pressure of 200° C. or less.

14. Blends or compounds obtained by blending or compounding the elastomer particles according to claim 11.

15. The blends or compounds according to claim 14, wherein the blends comprise a ratio of elastomer to carboxylic acid salts of mono- and multivalent metal ions of at least 250:1.

16. A method for making an article of manufacture comprising an elastomeric component, the method comprising producing the elastomeric component from the elastomer particles according to claim 11.

17. Articles of manufacture comprising the elastomer particles according to claim 11, wherein the articles of manufacture comprise inner liners, bladders, tubes, air cushions, pneumatic springs, air bellows, accumulator bags, hoses, conveyor belts, pharmaceutical closures, automobile suspension bumpers, auto exhaust hangers, body mounts, shoe soles, tire sidewalls, tire tread compounds, belts, hoses, shoe soles, gaskets, o-rings, wires/cables, membranes, rollers, bladders, 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, containers, bottles, totes, storage tanks, container closures, container lids; seals, sealants, material handling apparatus, augers, conveyor belts, cooling towers; metal working apparatus, any apparatus in contact with metal working fluids, an engine component, fuel lines, fuel filters, fuel storage tanks, gaskets, seals, a membrane, 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.