Claims:

1. Copolymers comprising or consisting of, preferably consisting of, three components:

component a) having at least one biuret or isocyanurate substructure,
component b) selected from polysiloxanes or polysiloxanes and polyhydrocarbons, preferably polysiloxanes,
component c) comprising a hydrocarbon which is different from component b) and has at least 6 carbon atoms and not more than 3 heteroatoms selected from the group of N, O, S,
where component b) is joined to 2 different or identical components a) via at least two positions, and
where the copolymers are free of isocyanate groups.

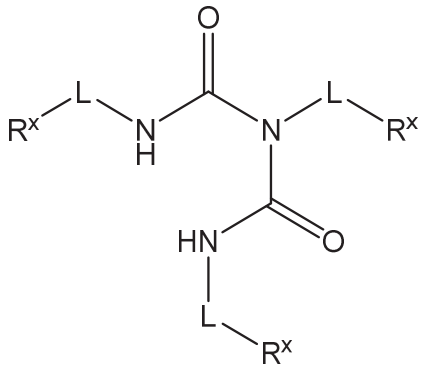
2. The copolymers according to Claim 1 have polybutadiene as polyhydrocarbon of component b).

3. The copolymers according to either of Claims 1 and 2 are free of halogen atoms, particularly preferably free of fluorine atoms, and are free of polyether structures, preferably free of oxyalkylene fragments bonded to one another.

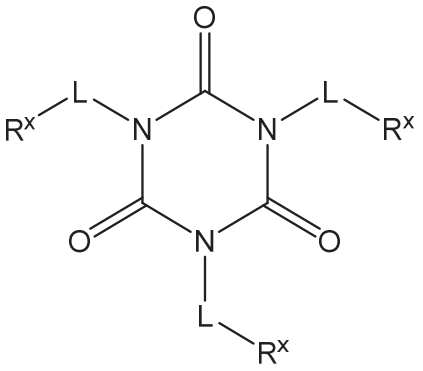
4. The copolymers according to any of Claims 1 to 3 have components a) and components c) in a ratio of number of c) divided by number of a) of 1 to 3, more preferably of 1.3 to 2.7, particularly preferably of 1.6 to 2.4 and especially preferably of 1.8 to 2.2.

5. The copolymers according to any of Claims 1 to 4 each have, in component a), two or more biuret or isocyanurate substructures, more preferably from more than 1 to 4, even more preferably from 1.2 to 3, particularly preferably from 1.3 to 2.5, and especially preferably have from 1.4 to 2 biuret or isocyanurate substructures.

6. The copolymers according to any of Claims 1 to 5 have, as component a), independently identical or different biuret substructures of the formula (III) and isocyanurate substructures of the formula (IV)



(III)



(IV)

in which

L is divalent radicals of tolyl (2,4-; 2,6-), ethylphenyl, 1,5-naphthyl, α,ω-tetramethylene, α,ω-hexamethylene, α,ω-dodecamethylene, α,ω-2-methylpentamethylene, α,ω-2,2,4-trimethylhexamethylene, cyclohexyl (1,4-), 1-methylcyclohexyl (1,3-; 1,4-; 2,6-), 2,2,6-trimethylcyclohexyl, isophorone (3,3,5-trimethylcyclohexyl), 4,4‘-dicyclohexylmethyl, 4,4'-dicyclohexylpropane-(2,2), 4,4‘-diphenylmethane, preferably hexamethylene, 4,4‘-diphenylmethane and isophorone,

R^x is independently the bonding site to component b) and component c),

and denotes a urethane group or urea group in the case of the bond to component b),

and denotes a urethane group, a urea group or a thiourea group in the case of the bond to component c),

where these urethane, urea and thiourea groups are bonded via the nitrogen atom to formula (III) and formula (IV),

or R^x denotes a bond to a further biuret or isocyanurate substructure, preferably with bonding of biuret substructures to biuret substructures and preferably of isocyanurate substructures to isocyanurate substructures;

and have, as component b), preferably a polysiloxane of the formula (I)

$$M^1_{a1}M^2_{a2}M^3_{a3}D^1_{b1}D^2_{b2}D^3_{b3}T_cQ_d \qquad (I)$$

with

$M^1 = [R^1_3SiO_{1/2}]$, $M^2 = [R^2R^1_2SiO_{1/2}]$, $M^3 = [R^3R^1_2SiO_{1/2}]$,

$D^1 = [R^1_2SiO_{2/2}]$, $D^2 = [R^1R^2SiO_{2/2}]$, $D^3 = [R^1R^3SiO_{2/2}]$,

$T = [R^1SiO_{3/2}]$,

$Q = [SiO_{4/2}]$,

where

a1 = 0 to 20, preferably 1 to 10, especially 2 to 5;

a2 = 0 to 10, preferably 0 to 5, especially 0;

a3 = 0 to 20, preferably 1-10, especially 2 to 5;

b1 = 1 to 1000, preferably 5 to 500, especially 10 to 200;

b2 = 0 to 10, preferably 0 to 5, especially 0;

b3 = 0 to 20, preferably greater than 0 up to 10, especially 1 to 5;

c = 0 to 10, preferably greater than 0 up to 5, especially 1 to 5;

d = 0 to 50, preferably 0 to 10, especially 0 to 2;

with the proviso that at least one of the indices a3 and b3 is greater than 1, the sum total of a3 and b3 preferably being at least 2;

R^1 = independently identical or different linear or branched, saturated or unsaturated hydrocarbyl radicals having 1 to 30 carbon atoms or aromatic hydrocarbyl radicals having 6 to 30 carbon atoms,

preferably alkyl radicals having 1 to 14 carbon atoms or monocyclic aromatics,

further preferably methyl, ethyl, propyl or phenyl, especially methyl;

R^2 = independently identical or different linear or branched, saturated or unsaturated, optionally substituted hydrocarbyl radicals, where preferred hydrocarbons have 2 to 30 carbon atoms, more preferably 2 to 16 carbon atoms, where the substituents may be selected from methoxy, ethoxy, propoxy, butoxy, pentoxy and glycidyloxy,

R^2 preferably being a glycidyloxy-substituted alkylene radical having 2 to 6 carbon atoms,

R^2 especially preferably being a glycidyloxypropyl radical;

R^3 = a divalent hydrocarbon having 2 to 8 carbon atoms, preferably 2 to 6, especially preferably 2 to 3, the second bond of which is the bonding site to component a) via preferably a urethane or urea group;

and have, as component c), hydrocarbons having exactly one bonding site to component a), the hydrocarbons is preferably having, aside from carbon and hydrogen, not more than 3 heteroatoms, more preferably not more than 2 heteroatoms, particularly preferably not more than one heteroatom and especially preferably no heteroatoms; if component c) has heteroatoms, these are preferably selected from the group of N, O, S.

7. The copolymers according to Claim 6 have

in component a), as divalent L radical in the formula (III) or (IV), hexamethylene, 4,4‘-diphenylmethane and isophorone;

in component b), a siloxane of the formula (I) with the indices

a3 = 2 to 5

a1 = 0 to 1

a2 = 0

b2 and b3 = 0

d = 0

R^1 = methyl or phenyl

in component c), a hydrocarbon which is free of heteroatoms and has aromatic rings, preferably one or more benzene rings, one of the aromatic rings particularly preferably having the bonding site to component a).

8. Process for preparing the copolymers according to any of Claims 1 to 7, wherein, in the first step, an intermediate comprising components a) and components c) is prepared and, in the second step, the intermediates are converted to the copolymer.

9. Compositions comprising the copolymers according to any of Claims 1 to 8 and additives and/or auxiliaries.

10. Aqueous emulsion comprising the copolymers according to any of Claims 1 to 7 or the process products according to Claim 8 comprising additives and/or auxiliaries.

11. Compositions according to Claim 9 or aqueous emulsions according to Claim 10 comprising, as at least one additive, a booster, preferably a polycarbodiimide.

12. Use of the compositions or aqueous emulsions according to any of Claims 9 to 11 for finishing of fabrics.

13. Method of liquid- and soil-repellent impregnation of textile fabrics by using the copolymers according to any of Claims 1 to 7.

14. Method of liquid- and soil-repellent impregnation of textile fabrics according to Claim 13 using the compositions according to Claim 11.

15. Repellent textile fabric comprising the copolymers according to any of Claims 1 to 7 with retention of or improvement in the tactile properties.