Claims:

1. A process for producing a halogenated polyisoolefin copolymer, the process comprising:

copolymerizing a monomer mixture of at least one isoolefin monomer and 5-20 wt% of at least one multiolefin monomer, based on weight of the monomers in the monomer mixture, in the presence of an initiator system to produce a polyisoolefin copolymer and oligomers;

halogenating the polyisoolefin copolymer to produce a halogenated polyisoolefin copolymer having a halogen content of 0.05-2.5 mol% and a halogenated oligomer content of less than 65% of total oligomer content in the halogenated polyisoolefin copolymer; and,

providing a stabilizer to the polyisoolefin copolymer and/or to the halogenated polyisoolefin copolymer, the stabilizer comprising a mixture of a lower critical solution temperature (LCST) compound and a metal carboxylate, the metal carboxylate provided in an amount of 1.25 wt% or less based on a weight of the copolymer.

2. The process according to claim 1, wherein the 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, compounds of formula (I)

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

where y = 3 to 10 and x and z = 1 to 8, whereby y+x+z is from 5 to 18, polyethyleneglycol-co-polypropylene glycol, 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 or diethyl ether with 4 to 50 ethyleneglycol units, polypropylene glycol monomethyl, dimethyl, monoethyl or diethyl ether with 4 to 50 propyleneglycol units or mixtures thereof.

3. The process according to claim 1, wherein the metal carboxylate comprises calcium stearate.

4. The process according to claim 1, wherein the stabilizer is provided to the halogenated polyisoolefin copolymer after halogenation of the polyisoolefin copolymer.

5. The process according to claim 1, wherein the monomer mixture comprises 2-20 mol% of the at least one multiolefin monomer.

6. The process according to claim 1, wherein the halogenated oligomer content is 50% or less of total oligomer content in the halogenated polyisoolefin copolymer.

7. The process according to claim 1, wherein:

the at least one isoolefin monomer comprises isobutene;

the at least one multiolefin monomer comprises isoprene;

the halogenating comprising brominating the polyisoolefin copolymer to produce a brominated polyisoolefin copolymer having a bromine content of 0.05-2.5 mol% and a brominated oligomer content of less than 65% of total oligomer content in the brominated polyisoolefin copolymer; and

the metal carboxylate is in an amount of 0.5-1.24 wt% based on weight of the copolymer.

8. The process according to claim 1, wherein the metal carboxylate is provided in an amount of 0.2-1.24 wt% based on weight of the copolymer.

9. The process according to claim 1, wherein the metal carboxylate is provided in an amount of 0.5-1.24 wt% based on weight of the copolymer.

10. The process according to claim 1, wherein the monomer mixture comprises 2.5-7.5 mol% of the at least one multiolefin monomer.

11. The process according to claim 1, wherein the halogenated oligomer content is 20% or less of total oligomer content in the halogenated polyisoolefin copolymer.