CLAIMS

1. A masterbatch composition, comprising:

a diene homopolymer or a diene copolymer, and

a phosphoruous desulfurization reagent,

wherein the masterbatch composition has a gel content as measured by gravimetric gel determination of less than 5 %, and

wherein the desulfurization reagent is a trivalent phosphorous reagent according to one of the general formula (I) – (IV):

$P[(R)_a(OR)_b(NR_2)_c(SR)_d(SiR_3)_e]$ (I)

where a = 0, 1, 2, or 3

b = 0, 1 or 2;

c = 0, 1, 2 or 3;

d = 0, 1, 2, or 3;

and a + b + c + d + e = 3

$R_2P\text{-}PR_2$ (II)

$PR_2\text{-}R^1\text{-}[PR\text{-}R^1\text{-}]_nPR_2$ with n = 0 to 4 (III)

$P(\text{-}R^1\text{-}PR_2)_3$ (IV)

where

R, same or independently: H, linear and branched alkyl, aryl especially phenyl and alkylated phenyl, benzyl, polybutadienyl, polyisoprenyl, polyacryl, halide, and

R^1 same or independently: alkylidene, ethylene glycole, propylene glycole, di-substituted aryl, or

the desulfurization reagent is a phosphonium salt of the formula (V),

$$[PR_3R^x]^+ A^- \qquad (V)$$

where

R is the same or independently: H, linear and branched alkyl, aryl especially phenyl and alkylated phenyl, benzyl, polybutadienyl, polyisoprenyl, polyacryl, halide

and

R^x is H, linear and branched alkyl, aryl especially phenyl and alkylated phenyl, benzyl, polybutadienyl, polyisoprenyl, polyacryl

and

A^- is F^-, Cl^-, Br^-, J^-, OH^-, SH^-, BF_4^-,1/2 SO_4^{2-}, HSO_4^-, HSO_3^-, NO_2^-, NO_3^-, carboxylate R-C(O)O^-, dialkyl phosphate $(RO)_2P(O)O^-$, dialkyl dithiophosphate $(RO)_2P(S)S^-$, dialkyl phosphorothioate $(RO)_2P(S)O^-$.

2. The masterbatch composition according to claim 1,

wherein the masterbatch composition has a decrease of less than 5% in Mooney viscosity ($M_L(1+4)_{100°C}$) when maintained at 25°C for five days, and

wherein the masterbatch composition has a decrease of more than 25% in Mooney viscosity ($M_L(1+4)_{100°C}$) when maintained at 70°C for seven days.

3. The masterbatch composition according to claim 2,

wherein the masterbatch composition when mixed with a rubber compound mixture, does not decrease the Mooney viscosity ($M_L(1+4)_{100°C}$) of the rubber compound mixture, said rubber compound comprising at least a rubber, a filler, a coupling agent, and at least one crosslinking system comprising at least one crosslinker and optionally one or more crosslinking accelerators.

4. The masterbatch composition according to claim 1,

wherein the desulfurization reagent is present in an amount of from 0.01 to 5 phr, preferably 0.05 to 3 phr, and particularly preferred 0.1 to 2.5 phr.

5. The masterbatch composition according to claim 1, further comprising:

a coupling agent, wherein the coupling agent is a sulphur containing silane comprising a sulfane moiety and having a molar ratio of sulfur to silicium of less than 1.35 : 1, more preferably less than 1.175 : 1.

6. The masterbatch composition according to claim 1,

wherein the diene homopolymer or the diene copolymer are obtained via copolymerization of conjugated diene monomers or conjugated diene monomers with vinylaromatic co-monomers.

7. The masterbatch composition according to claim 1,

wherein the diene homopolymer or the diene copolymer are one or more of polyisoprene, natural rubber, polybutadiene, or polybutadiene-styrene.

8. The masterbatch composition according claim 1,

wherein the desulfurization reagent is triphenyl phosphine.

9. A vulcanizable rubber compound, comprising:

the masterbatch composition according claim 1,

a rubber,

a filler,

a coupling agent, and

at least one crosslinking system comprising at least one crosslinker and optionally one or more crosslinking accelerators.

10. The vulcanizable rubber compound according to claim 9, further comprising:

one or more further rubber auxiliaries.

11. The vulcanizable rubber compound according to claim 9, wherein the filler comprises a mixture of silica filler and carbon black filler, the mixing ratio of silica filler to carbon black being 0.01:1 to 50:1.

12. The vulcanizable rubber compound according to claim 9, wherein the coupling agent is a sulphur containing silane comprising a sulfane moiety.

13. The vulcanizable rubber compound according to claim 9, wherein the coupling agent is one or more of bis[3-(triethoxysilyl)propyl]monosulfane, bis[3(triethoxysilyl)propyl]disulfane, bis[3-(triethoxysilyl)propyl]trisulfane and bis[3(triethoxysilyl)propyl]-tetrasulfane.

14. A process for producing the vulcanizable rubber compound according to claim 9, comprising:

mixing together the masterbatch composition, a rubber, a silica filler, a coupling agent, and at least one crosslinking system having at least one crosslinker, wherein said mixing step does not decrease the Mooney viscosity ($M_L(1+4)_{100°C}$) of the vulcanizable rubber compound.

15. A process for producing vulcanizates, comprising:

vulcanizing the vulcanizable compound according to claim 9.

16. The process according to claim 15, wherein said vulcanizing step is performed at a temperature in the range from 100°C to 200°C, preferably from 120°C to 190°C.

17. Vulcanizates obtained by the process according to claim 15.

18. The vulcanizates according to claim 17, wherein said vulcanizates are shaped in the form of shaped bodies, more preferably in the form of a drive belt, of roller coverings, of a seal, of a cap, of a stopper, of a hose, of floor covering, of sealing mats or sheets, profiles or membranes, tires, tire treads, or layers thereof.