CLAIMS

1. A star-branched diene rubber comprising

a vinyl content, as determined via FTIR spectroscopy on a polymer film, of less than 15 wt.-% based on the total weight of the rubber,

a Mooney viscosity (ML 1+4 at 100°C, as determined by the standard ASTM D1646 (1999)) from 30 to 80 MU,

a solution viscosity, as determined at a polybutadiene rubber concentration of 5 wt.-% in styrene by using a B-type viscometer placed in a thermostat at 25°C, in the range of 30 to 60 mPas,

a low rubber discoloration expressed by APHA number (5% solution in styrene according to DIN EN ISO 6271) of less than 100, and

wherein a ratio of the Mooney viscosity to the solution viscosity is greater than 1.0.

2. The star-branched diene rubber according to claim 1, wherein said star-branched rubber comprises the reaction product of at least one conjugated diene rubber and a coupling agent according the formula (I)

$$R_1\text{-}\ R_2\text{-Si-}(R_3)_3 \qquad (I)$$

where

R_1 is glycidoxy,

R_2 is optionally substituted C_1 to C_8 alkylene optionally containing one or more oxygens, and

R_3 is C_1 to C_8 alkoxy.

3. The star-branched diene rubber according to claim 1 or claim 2 wherein the monomer for making the polymer chains is selected from the group of 1,3-butadiene, isoprene, 2,3-dimethyl-1,3-butadiene, 1,3-pentadiene, 1,3-hexadiene, 3-butyl-1,3-octadiene, 2-phenyl-1,3-butadiene, 1,3-octadiene or mixtures thereof.

4. The star-branched diene rubber according to any of claims 2 to 3, wherein the coupling agents are 3-glycidoxypropyltrimethoxysilane and 3-glycidoxypropyltriethoxysilane.

5. The star-branched diene rubber according to any of claims 1 to 4, wherein the composition has a pH of less than 11.

6. The star-branched diene rubber according to any of claims 1 to 5, wherein the rubber has a peak molecular weight (Mp), as determined by means of gel permeation chromatography (GPC), calibrated with polystyrene standards, of greater than 300,000 g/mol.

7. A process for the production of the star-branched diene rubber according to any of claims 1 to 6, comprising:

polymerizing at least one conjugated diene monomer, thereby forming a diene polymer, and

reacting the diene polymer with a coupling agent according to the formula (I)

$$R_1\text{- } R_2\text{-Si-}(R_3)_3 \qquad (I)$$

where

R_1 is glycidoxy,

R_2 is optionally substituted C_1 to C_8 alkylene optionally containing one or more oxygens, and

R_3 is C_1 to C_8 alkoxy.

8. The process according to claim 7, wherein the at least one conjugated diene monomer is selected from 1,3-butadiene, isoprene, 2,3-dimethyl-1,3-butadiene, 1,3-pentadiene, 1,3-hexadiene, 3-butyl-1,3-octadiene, 1,3-octadiene, 2-phenyl-1,3-butadiene or mixtures thereof.

9. The process according to claim 7 or claim 8, wherein the coupling agents are 3-glycidoxypropyltrimethoxysilane and 3-glycidoxypropyltriethoxysilane.

10. The process according to any of claims 7 to 9, further comprising:

adjusting the pH of the star-branched diene rubber to less than 11.

11. A high-impact polystyrene (HIPS) or acrylonitrile butadiene styrene (ABS) compound, comprising:

the star-branched diene rubber according to any of claims 1 to 6, wherein a polystyrene portion for HIPS or styrene-acrylonitrile copolymer portion for ABS are grafted to said star-branched diene rubber.

12. The high-impact polystyrene (HIPS) or acrylonitrile butadiene styrene (ABS) compound according to claim 11, wherein the star-branched diene rubber is selected from the group of poly(1,3-butadiene), polyisoprene, poly(2,3-dimethyl-1,3-butadiene), poly(1,3-pentadiene), poly(1,3-hexadiene), poly(1,3-octadiene), poly(3-butyl-1,3-octadiene), poly(2-phenyl-1,3-butadiene) or mixtures thereof, more preferably from a group comprising poly(1,3-butadiene), polyisoprene and mixtures thereof.

13. The high-impact polystyrene (HIPS) or acrylonitrile butadiene styrene (ABS) compound according to claim 11 or claim 12, wherein the coupling agents are 3-glycidoxypropyltrimethoxysilane and 3-glycidoxypropyltriethoxysilane.

14. The high-impact polystyrene (HIPS) or acrylonitrile butadiene styrene (ABS) compound according to any of claims 11 to 13, wherein the star-branched diene rubber has prior to grafting a pH of less than 11.

15. The high-impact polystyrene (HIPS) or acrylonitrile butadiene styrene (ABS) compound according to any of claims 11 to 14, wherein the star-branched diene rubber has prior to grafting a peak molecular weight greater than 300,000 g/mol.

16. Use of the star-branched diene rubber according to any of claims 1 to 6 in high-impact polystyrene (HIPS) or acrylonitrile butadiene styrene (ABS) compounds, especially for improving discoloration properties.