CLAIMS

[Claim 1]

A rubber composition comprising a rubber component, an additive, and a filler,

wherein the rubber component comprises a modified diene-based rubber,

wherein the additive comprises a compound including carbon atoms and at least one atomic species selected from the group consisting of silicon atoms, nitrogen atoms and oxygen atoms,

wherein the additive is present in an amount of from 0.001 to 5 parts by mass with respect to 100 parts by mass of the rubber component;

a total number of silicon atoms, nitrogen atoms and oxygen atoms constituting the compound is 0.27 or more and 0.80 or less with respect to a number of the carbon atoms;

a Hansen solubility parameter of the compound satisfies a relationship represented by the following formula (2):

$$6 \leq \{4(\delta D_1-\delta D_2)^2+(\delta P_1-\delta P_2)^2+(\delta H_1-\delta H_2)^2\}^{0.5} \quad (2)$$

wherein δD indicates a dispersion term, δP indicates a polarity term, and δH indicates a hydrogen bond term; and

a molecular weight of the compound is 200 or more and 15000 or less.

[Claim 2]

The rubber composition according to claim 1, wherein the compound has a structure based on at least one selected from the group consisting of an amino group, a siloxy group, an imino group, an ether bond, an ester bond and an amide bond.

[Claim 3]

The rubber composition according to claim 1 or 2, wherein the compound has a tertiary amino group.

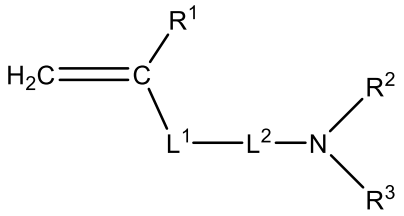
[Claim 4]

A rubber composition comprising a rubber component, an additive, and a filler,

wherein the rubber component comprises a modified diene-based rubber,

wherein the additive comprises a polymerized product of a monomer represented by the following formula (I):

[Chemical Formula 1]



(I)

wherein R^1 indicates a hydrogen atom or a methyl group, R^2 and R^3 each independently indicate an alkyl group, L^1 indicates an amide bond or an ester bond, and L^2 indicates an alkanediyl group optionally having a substituent,

wherein the additive is present in an amount from 0.001 to 5 parts by mass with respect to 100 parts by mass of the rubber component.

[Claim 5]

A method for producing a rubber composition according to any one of claims 1 to 4, comprising a step of mixing the rubber component and the additive.

[Claim 6]

A method for producing a rubber composition according to claim 4, the method comprising:

a step of obtaining a polymerized solution containing the diene-based rubber by a solution polymerization process in a polymerization reactor; and

a step of preparing the additive by adding the monomer represented by the above formula (I) to the polymerization reactor containing the polymerized solution and polymerizing the monomer.