DESCRIPTION

Title of Invention: RUBBER COMPOSITION AND METHOD FOR PRODUCING RUBBER COMPOSITION

Technical Field

[0001] The present invention relates to a rubber composition and a method for producing the rubber composition.

Background Art

[0002] In recent years, due to growing interest in environmental issues, there has been an increasing demand of fuel saving for motor vehicles, and a rubber composition used in tires for the motor vehicles is also required to have excellent fuel saving performance. As the rubber composition for the motor vehicle tires, a rubber composition containing a conjugated diene-based polymer and a filler such as silica is used.

[0003] On the other hand, the rubber composition containing the filler such as silica tends to be poor in processability. Therefore, it is proposed to improve the processability of the rubber composition for the tires by blending specific silica having fine particle size and specific monoalkanolamide to the rubber component (see Patent Literature 1, for example).

Citation List

Patent Literature

[0004] Patent Literature 1: JP 2013-245264 A

Summary

[0004a] In one aspect of the present disclosure, there is provided a rubber composition comprising a rubber component, an additive, and a filler,

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;

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):

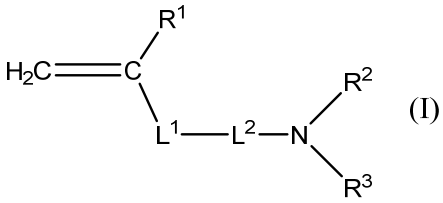
$$6 \leq \{4(\delta D_1-\delta D_2)^2+(\delta P_1-\delta P_2)^2+(\delta H_1-\delta H_2)^2\}^{0.5} \quad (2)$$

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.

In another aspect of the present disclosure, there is provided a rubber composition comprising a rubber component, an additive, and a filler, 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.

In a further aspect of the present disclosure, there is provided a method for producing a rubber composition disclosed herein, comprising a step of mixing the rubber component and the additive.

In another aspect of the present disclosure, there is provided a method for producing a rubber composition disclosed herein, 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.

Technical Problem

[0005] A rubber composition for motor vehicle tires is required to be excellent in both of processability and fuel saving performance, but it is