CLAIMS

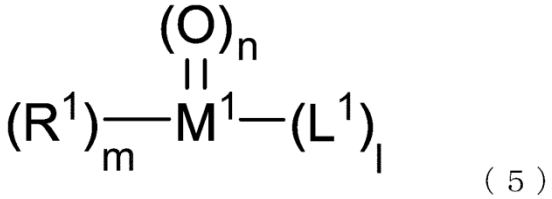
1. A method for producing a modified conjugated diene-based polymer, comprising a step of allowing an organometallic compound to react with a conjugated diene-based polymer having a unit based on a conjugated diene compound-containing monomer, and a unit based on a modifying agent that has a silicon atom, tin atom, germanium atom or phosphorus atom, wherein the organometallic compound is at least one selected from the group consisting of an organic alkali metal compound and an organic alkaline earth metal compound.

2. The method according to claim 1, wherein the conjugated diene-based polymer has the unit based on the modifying agent at the ends.

3. The method according to claim 1 or 2, wherein the conjugated diene-based polymer has the unit based on the modifying agent within the polymer chain.

4. The method according to any one of claims 1 to 3, wherein the modifying agent includes a compound having a structure represented by formula (5):

[Chemical Formula 1]



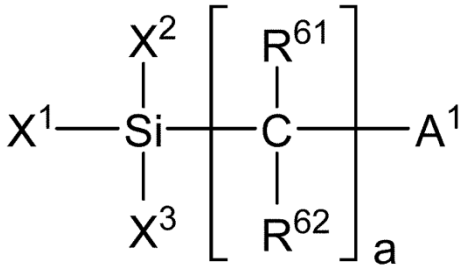
(5)

wherein R^1 represents an alkyl, alkenyl, cycloalkenyl or aryl group, M^1 represents a silicon atom, tin atom, germanium atom or phosphorus atom, L^1 represents a halogen atom or a hydrocarbyloxy group, and when multiple R^1 and L^1 groups are present they may be the same or different,

when M^1 is a silicon atom, tin atom or germanium atom, n represents 0 and m and l are each independently an integer of 0 to 4 such that m + l = 4 is satisfied, and when M^1 is a phosphorus atom, n represents 0 or 1 and m and l are each independently an integer of 0 to 3 such that m + l = 3 is satisfied.

5. The method according to any one of claims 1 to 4, wherein the modifying agent includes a compound having a structure represented by formula (6):

[Chemical Formula 2]



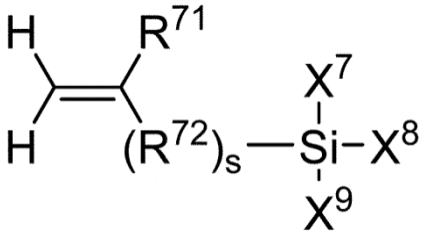
(6)

wherein X^1, X^2 and X^3 each independently represent a hydrocarbyl group, a hydrocarbyloxy group, a halogen atom or a functional group capable of reacting with the active ends of the conjugated diene-based polymer, R^{61} and R^{62} each independently represent a hydrogen atom or a hydrocarbyl group, and when multiple R^{61} and R^{62} groups are present they may be the same or different, A^1 represents an organic group having at least one atom selected from the group consisting of oxygen atoms, nitrogen atoms, phosphorus atoms, sulfur atoms and silicon atoms, optionally having a ring structure, with a portion of the structure of X^1, X^2 or X^3 optionally bonded to a portion of A^1, and "a" represents an integer of 0 to 10.

6. The method according to any one of claims 1 to 5, wherein the modifying agent includes a compound having a structure represented by

formula (7):

[Chemical Formula 3]



(7)

wherein R^{71} represents a hydrogen atom or a hydrocarbyl group, s represents 0 or 1, R^{72} represents a hydrocarbylene group, X^7, X^8 and X^9 each independently represent a substituted amino group, or an optionally substituted hydrocarbyl group, with at least one of X^7, X^8 and X^9 being a substituted amino group.

7. A method for producing a polymer composition, comprising a step of kneading 10 to 150 parts by mass of a reinforcing material with respect to 100 parts by mass of a modified conjugated diene-based copolymer produced by the method according to any one of claims 1 to 6.