disclosure.

[0008] Specifically, the present disclosure provides a conjugated diene polymer containing at least conjugated diene monomer units, wherein the conjugated diene polymer contains 95 weight ppm or more of silicon and has an ionic strength index of 75% or less.

[0008a] In an aspect, the present disclosure provides a conjugated diene polymer containing at least conjugated diene monomer units,

wherein the conjugated diene polymer contains 95 weight ppm or more of silicon, has an ionic strength index calculated from Expression (I) of 75% or less, has a weight average molecular weight (Mw) of 500000 to 10000000, and has a molecular weight distribution curve where 3 or more peaks are present, and wherein Expression (I) is:

$$\text{ionic strength index (\%)} = \{1 - (A_{CX}/B_{CX}) \times (B_{sty}/A_{sty})\} \times 100 \quad (I)$$

$A_{CX}$: The peak area of the molecular weight distribution curve of the conjugated diene polymer obtained by GPC measurement using a cation exchange column

$B_{CX}$: The peak area of the peak of the internal standard polystyrene obtained by GPC measurement using a cation exchange column

$B_{sty}$: The peak area of the peak of the internal standard polystyrene obtained by GPC measurement using a styrene-based column

$A_{sty}$: The peak area of the molecular weight distribution curve of the conjugated diene polymer obtained by GPC measurement using a styrene-based column.

[0009] Preferably, the conjugated diene polymer according to the present disclosure has a molecular weight distribution (Mw/Mn) of 1.5 or more.

Preferably, the conjugated diene polymer according to the present disclosure has a weight average molecular weight (Mw) of 200000 or more. Preferably, the conjugated diene polymer according to the present disclosure contains 150 weight ppm or more of silicon.

Preferably, the conjugated diene polymer according to the present

disclosure has an ionic strength index of 0.5 to 60%. Preferably, the conjugated diene polymer according to the present disclosure has a molecular weight distribution curve where two or more peaks are present.

Preferably, the conjugated diene polymer according to the present disclosure has a terminal modifying group.

[0010] In another aspect, the present disclosure provides a rubber composition comprising the conjugated diene polymer as defined above, and a filler.

In other aspects, the present disclosure provides a cross-linked rubber prepared by cross-linking the rubber composition as defined above, and a tire comprising such a cross-linked rubber as defined above.

EFFECTS

[0011] The present disclosure provides a conjugated diene polymer which has high processability and can provide a cross-linked rubber having high wear resistance and excellent fuel efficiency. The present disclosure also provides a rubber composition, a cross-linked rubber, and a tire prepared

CLAIMS

[Claim 1] A conjugated diene polymer containing at least conjugated diene monomer units,

wherein the conjugated diene polymer contains 95 weight ppm or more of silicon, has an ionic strength index calculated from Expression (I) of 75% or less, has a weight average molecular weight (Mw) of 500000 to 10000000, and has a molecular weight distribution curve where 3 or more peaks are present, and wherein Expression (I) is:

ionic strength index (%) = $\{1 - (A_{CX}/B_{CX}) \times (B_{sty}/A_{sty})\} \times 100$ (I)

$A_{CX}$: The peak area of the molecular weight distribution curve of the conjugated diene polymer obtained by GPC measurement using a cation exchange column

$B_{CX}$: The peak area of the peak of the internal standard polystyrene obtained by GPC measurement using a cation exchange column

$B_{sty}$: The peak area of the peak of the internal standard polystyrene obtained by GPC measurement using a styrene-based column

$A_{sty}$: The peak area of the molecular weight distribution curve of the conjugated diene polymer obtained by GPC measurement using a styrene-based column.

[Claim 2] The conjugated diene polymer according to claim 1, wherein the conjugated diene polymer has a molecular weight distribution (Mw/Mn) of 1.5 or more.

[Claim 3] The conjugated diene polymer according to claim 1 or 2, wherein the conjugated diene polymer has a weight average molecular weight (Mw) of 200000 or more.

[Claim 4] The conjugated diene polymer according to any one of claims 1

to 3, wherein the conjugated diene polymer contains 150 weight ppm or more of silicon.

[Claim 5] The conjugated diene polymer according to any one of claims 1 to 4, wherein the conjugated diene polymer has an ionic strength index of 0.5 to 60%.

[Claim 6] The conjugated diene polymer according to any one of claims 1 to 5, wherein the conjugated diene polymer has a molecular weight distribution curve where 3 to 6 peaks are present.

[Claim 7] The conjugated diene polymer according to any one of claims 1 to 6, wherein the conjugated diene polymer has a terminal modifying group.

[Claim 8] A rubber composition comprising the conjugated diene polymer according to any one of claims 1 to 7, and a filler.

[Claim 9] A cross-linked rubber prepared by cross-linking the rubber composition according to claim 8.

[Claim 10] A tire comprising the cross-linked rubber according to claim 9.