CLAIMS

1. A formulation for rubber composition, comprising

100 parts by weight of a diene elastomer,

30 to 70 parts by weight of a reinforcing filler,

0.1 to 8 parts by weight of an antidegradant composition, and

0.5 to 3 parts by weight of a crosslinker,

wherein the antidegradant composition comprises a 6PPD antidegradant and an S-TMQ, a purity of the 6PPD antidegradant is equal to or greater than 98%, and the S-TMQ is a TMQ antidegradant with a total content of dimer, trimer, and tetramer of 1,2-dihydro-2,2,4-trimethylquinoline equal to or greater than 80%.

2. The formulation for rubber composition according to claim 1, wherein the purity of the 6PPD antidegradant is equal to or greater than 98.5%.

3. The formulation for rubber composition according to claim 1, wherein a number of varieties of organic volatiles in the 6PPD antidegradant is no more than 5.

4. The formulation for rubber composition according to claim 1, wherein a total content of organic volatiles in the 6PPD antidegradant is equal to or less than 10% of the total content of the organic volatiles in a 6PPD antidegradant with a purity of 97%;

a content of 4-methyl-2-pentanone in the 6PPD antidegradant is equal to or less than 12%

of the content of 4-methyl-2-pentanone in the 6PPD antidegradant with the purity of 97%; and

a content of aniline in the 6PPD antidegradant is equal to or less than 6.2% of the content of aniline in the 6PPD antidegradant with the purity of 97%.

5. The formulation for rubber composition according to claim 1, wherein a total content of dimer, trimer, and tetramer of 1,2-dihydro-2,2,4-trimethylquinoline in the S-TMQ is equal to or greater than 80.2%.

6. The formulation for rubber composition according to claim 1, wherein a number of varieties of organic volatiles in the S-TMQ is no more than 8.

7. The formulation for rubber composition according to claim 1, wherein a total content of organic volatiles in the S-TMQ is equal to or less than 41.7% of the total content of the organic volatiles in a TMQ antidegradant with a total content of dimer, trimer, and tetramer of 1,2-dihydro-2,2,4-trimethylquinoline of 51%;

a content of acetone in the S-TMQ is equal to or less than 20.5% of the content of acetone in the TMQ antidegradant with the total content of dimer, trimer and tetramer of 1,2-dihydro-2,2,4-trimethylquinoline of 51%;

a content of aniline in the S-TMQ is equal to or less than 27.3% of the content of aniline in the TMQ antidegradant with the total content of dimer, trimer and tetramer of 1,2-dihydro-2,2,4-trimethylquinoline of 51%; and

a content of 1,2-dihydro-2,2,4-trimethylquinoline monomer in the S-TMQ is equal to or

less than 64.8% of the content of 1,2-dihydro-2,2,4-trimethylquinoline monomer in the TMQ antidegradant with the total content of dimer, trimer and tetramer of 1,2-dihydro-2,2,4-trimethylquinoline of 51%.

8. The formulation for rubber composition according to claim 1, wherein mass ratio of the 6PPD antidegradant to the S-TMQ is 1:0.2 to 1:1 in the antidegradant composition.

9. The formulation for rubber composition according to claim 1, wherein, based on 100 parts by weight of the diene elastomer, the formulation comprises 2 to 5 parts by weight of the antidegradant composition.

10. The formulation for rubber composition according to claim 1, wherein the antidegradant composition consists of the 6PPD antidegradant with the purity of equal to or greater than 98% and the S-TMQ.

11. The formulation for rubber composition according to claim 1, wherein the diene elastomer comprises one or more selected from natural rubber, butadiene rubber, isoprene rubber, styrene butadiene rubber, chloroprene rubber, nitrile rubber, isoprene-butadiene copolymer, isoprene-styrene copolymer, and isoprene-butadiene/styrene copolymer.

12. The formulation for rubber composition according to claim 11, wherein the diene elastomer comprises natural rubber and butadiene rubber amd mass ratio of the natural rubber to

the butadiene rubber is from 4:6 to 6:4.

13. The formulation for rubber composition according to claim 1, wherein the reinforcing filler comprises one or more selected from carbon black, titanium oxide, magnesium oxide, calcium carbonate, magnesium carbonate, aluminum hydroxide, magnesium hydroxide, clay, and talc.

14. The formulation for rubber composition according to claim 1, wherein the crosslinker is sulfur.

15. The formulation for rubber composition according to claim 1, further comprising one or more selected from softeners, activators, and promoters.

16. The formulation for rubber composition according to claim 1, comprising

100 parts by weight of the diene elastomer,

40 to 60 parts by weight of carbon black,

1 to 2 parts by weight of sulfur,

2 to 3 parts by weight of the 6PPD antidegradant with the purity of equal to or greater than 98%,

0.5 to 2 parts by weight of the S-TMQ,

2 to 8 parts by weight of zinc oxide,

1 to 3 parts by weight of stearic acid,

1 to 10 parts by weight of naphthenic oil, and

0.5 to 1.5 parts by weight of a promoter,

wherein the diene elastomer comprises natural rubber and butadiene rubber with a mass ratio of from 4:6 to 6:4.

17. The formulation for rubber composition according to claim 1, wherein the purity of the 6PPD antidegradant is 98.5%;

a number of varieties of organic volatiles in the 6PPD antidegradant is 5;

a total content of the organic volatiles in the 6PPD antidegradant is 10% of the total content of the organic volatiles in a 6PPD antidegradant with a purity of 97%;

a content of 4-methyl-2-pentanone in the 6PPD antidegradant is 12% of the content of 4-methyl-2-pentanone in the 6PPD antidegradant with the purity of 97%;

a content of aniline in the 6PPD antidegradant is 6.2% of the content of aniline in the 6PPD antidegradant with a purity of 97%;

a total content of dimer, trimer, and tetramer of 1,2-dihydro-2,2,4-trimethylquinoline in the S-TMQ is 80.2%;

a number of varieties of organic volatiles in the S-TMQ is 8;

a total content of organic volatiles in the S-TMQ is 41.7% of the total content of the organic volatiles in a TMQ antidegradant with a total content of dimer, trimer, and tetramer of 1,2-dihydro-2,2,4-trimethylquinoline of 51%;

a content of acetone in the S-TMQ is 20.5% of the content of acetone in the TMQ antidegradant with the total content of dimer, trimer and tetramer of 1,2-dihydro-2,2,4-

trimethylquinoline of 51%;

a content of aniline in the S-TMQ is 27.3% of the content of aniline in the TMQ antidegradant with the total content of dimer, trimer and tetramer of 1,2-dihydro-2,2,4-trimethylquinoline of 51%; and

a content of 1,2-dihydro-2,2,4-trimethylquinoline monomer in the S-TMQ is 64.8% of the content of 1,2-dihydro-2,2,4-trimethylquinoline monomer in the TMQ antidegradant with the total content of dimer, trimer and tetramer of 1,2-dihydro-2,2,4-trimethylquinoline of 51%.

18. A rubber composition prepared according to the formulation for rubber composition as described in claim 1.

19. A rubber article comprising a rubber composition prepared according to the formulation for rubber composition as described in claim 1.