A. an organopolysiloxane having two alkenyl groups per molecule;

B. an organohydrogenpolysiloxane having two Si-H groups per molecule;

C. an organohydrogenpolysiloxane having three or more Si-H groups per molecule;

D. at least one compound selected from the group consisting of D1 and D2:

D1. an organopolysiloxane having one alkenyl group per molecule and

D2. an organohydrogenpolysiloxane having one Si-H group per molecule;

E. a platinum catalyst in an amount required for curing; and

F. a thermally conductive filler in an amount of 100 to 600 vol% with respect to 100 vol% of a total amount of the A to E,

wherein the components A to F are cured,

wherein the thermally conductive silicone gel composition comprises 1 to 300 parts by weight of the component B, 0.1 to 20 parts by weight of the component C, and 0.1 to 50 parts by weight of the component D with respect to 100 parts by weight of the component A, where a ratio of the Si-H group to the alkenyl group (Si-H group / alkenyl group) in all the components A to D is 0.5 to 2.0,

wherein the thermally conductive filler contains crushed alumina, and the crushed alumina is surface treated in advance with at least one silane coupling agent selected from an alkoxysilane compound expressed by $R_aSi(OR')_{4-a}$, where R represents a substituted or unsubstituted organic group having 1 to 20 carbon atoms, R' represents an alkyl group having 1 to 4 carbon atoms, and a is 0 or 1, a partial hydrolysate of the alkoxysilane compound, and an alkoxy group-containing silicone, and

wherein an oil bleeding rate of the thermally conductive silicone gel composition is 0.45 wt% or less, which is calculated by the following formula and measured in such a manner that the thermally conductive silicone gel composition is formed into a molded product with a width of 25 mm, a length of 25 mm, and a thickness of 3.0 mm, and then the molded product is sandwiched between polytetrafluoroethylene (PTFE) filter papers, compressed to a thickness of 1.8 mm, and allowed to stand for 24 hours in an atmosphere of 80°C,

Oil bleeding rate (wt%) = [(weight of filter paper after test – weight of filter paper before test) / weight of silicone gel before test] × 100.

Effects of the Disclosure

CLAIMS

1. A thermally conductive silicone gel composition comprising the following components A to F:

A. an organopolysiloxane having two alkenyl groups per molecule;

B. an organohydrogenpolysiloxane having two Si-H groups per molecule;

C. an organohydrogenpolysiloxane having three or more Si-H groups per molecule;

D. at least one compound selected from the group consisting of D1 and D2:

D1. an organopolysiloxane having one alkenyl group per molecule and

D2. an organohydrogenpolysiloxane having one Si-H group per molecule;

E. a platinum catalyst in an amount required for curing; and

F. a thermally conductive filler in an amount of 100 to 600 vol% with respect to 100 vol% of a total amount of the A to E,

wherein the components A to F are cured,

wherein the thermally conductive silicone gel composition comprises 1 to 300 parts by weight of the component B, 0.1 to 20 parts by weight of the component C, and 0.1 to 50 parts by weight of the component D with respect to 100 parts by weight of the component A, where a ratio of the Si-H group to the alkenyl group (Si-H group / alkenyl group) in all the components A to D is 0.5 to 2.0,

wherein the thermally conductive filler contains crushed alumina, and the crushed alumina is surface treated in advance with at least one silane coupling agent selected from an alkoxysilane compound expressed by $R_aSi(OR')_{4-a}$, where R represents a substituted or unsubstituted organic group having 1 to 20 carbon atoms, R' represents an alkyl group having 1 to 4 carbon atoms, and a is 0 or 1, a partial hydrolysate of the alkoxysilane compound, and an alkoxy group-containing silicone, and

wherein an oil bleeding rate of the thermally conductive silicone gel composition is 0.45 wt% or less, which is calculated by the following formula and measured in such a manner that the thermally conductive silicone gel composition is formed into a molded product with a width of 25 mm, a length of 25 mm, and a thickness of 3.0 mm, and then the molded product is sandwiched between polytetrafluoroethylene (PTFE) filter papers, compressed to a thickness of 1.8 mm, and allowed to stand for 24 hours in an atmosphere of 80°C,

Oil bleeding rate (wt%) = [(weight of filter paper after test – weight of filter paper before test) / weight of silicone gel before test] × 100.

2. The thermally conductive silicone gel composition according to claim 1, wherein a hardness of the thermally conductive silicone gel composition is 60 or less, which is measured by an ASKER rubber hardness tester, type C in accordance with JIS K 7312.

3. The thermally conductive silicone gel composition according to claim 1 or 2, wherein the alkenyl groups of the component A are present at both ends of an organopolysiloxane molecular chain.

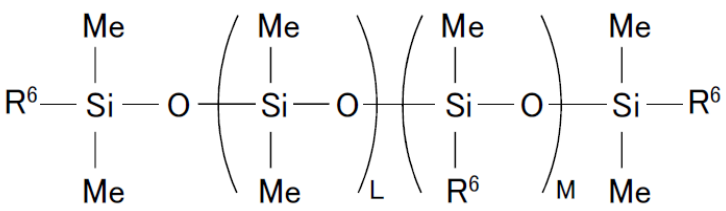
4. The thermally conductive silicone gel composition according to any one of claims 1 to 3, wherein the organopolysiloxane of the component A has a kinematic viscosity of 10 to 100000 mm^2/s at 25°C.

5. The thermally conductive silicone gel composition according to any one of claims 1 to 4, wherein a molecular structure of the component B is linear.

6. The thermally conductive silicone gel composition according to any one of claims 1 to 5, wherein the Si-H groups of the component B are present at both ends of a molecular chain.

7. The thermally conductive silicone gel composition according to any one of claims 1 to 6, wherein a number-average degree of polymerization of the component B is 2 to 1000.

8. The thermally conductive silicone gel composition according to any one of claims 1 to 7, wherein the organohydrogenpolysiloxane of the component C is expressed by the following chemical formula 1:
[Chemical Formula 1]



where R^6's are the same as or different from each other and represent hydrogen, alkyl groups, phenyl groups, epoxy groups, acryloyl groups, methacryloyl groups, or alkoxy groups, and at least three of R^6's are hydrogen, and

L represents an integer of 0 to 1000 and M represents an integer of 1 to 200.

9. The thermally conductive silicone gel composition according to any one of claims 1 to 8, wherein the components D1 and D2 have a kinematic viscosity of 10 to 100000 mm^2/s at 25°C.

10. The thermally conductive silicone gel composition according to any one of claims 1 to 9, wherein thermally conductive particles of the component F are inorganic particles of at least one selected from alumina, zinc oxide, magnesium oxide, aluminum nitride, boron nitride, aluminum hydroxide, and silica other than hydrophilic fumed silica.

11. The thermally conductive silicone gel composition according to any one of claims 1 to 10, wherein the thermally conductive particles of the component F are a combination of inorganic particles with an average particle size of 10 μm or less and inorganic particles with an average particle size of more than 10 μm.

12. The thermally conductive silicone gel composition according to claim 1, wherein the at least one silane coupling agent is added in an amount of 0.01 to 10 parts by weight with respect to 100 parts by weight of the thermally conductive particles of the component F for the surface treatment.