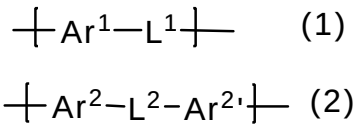
CLAIMS

[1] A composition for gap formation comprising a polymer and a solvent:

wherein said polymer comprising five or more of repeating units which are represented by at least one kind of the following formula (1) or (2):



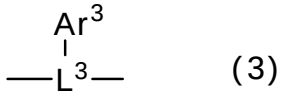
(1)

(2)

in which

each of Ar^1, Ar^2 and $Ar^{2'}$ is independently an aromatic group having one or more benzene rings provided that said aromatic group may be substituted with a substituent selected from the group consisting of alkyl, aryl, alkoxy, nitro, amide, dialkylamino, sulfonamide, imide, carboxyl, sulfonic ester, alkylamino and arylamino; and

each of L^1 and L^2 is independently oxygen, amide, carbonyl or a group represented by the following formula (3):



(3)

in which

Ar^3 is an aromatic group having one or more benzene rings provided that said aromatic group may be substituted with a substituent selected from the group consisting of alkyl, aryl, alkoxy, nitro, amide, dialkylamino, sulfonamide, imide, carboxyl, sulfonic ester, alkylamino and arylamino; and

L^3 is a trivalent atom selected from the group consisting of nitrogen and phosphorus.

[2] The composition for gap formation according to claim 1, wherein each of said Ar^1, Ar^2 and $Ar^{2'}$ is an aromatic group having one benzene ring.

[3] The composition for gap formation according to claim 1 or 2, wherein said polymer has a weight average molecular weight of 1000 to 1000000.

[4] The composition for gap formation according to any of claims 1 to 3, wherein the content of said polymer is in the range of 0.2 to 20 wt% based on the total weight of the composition.

[5] The composition for gap formation according to any of claims 1 to 4, which reduces the weight by 3% or less when heated at 400°C for 1 hour and reduces the weight by 90% or more when heated at 600°C for 1 hour, in an atmosphere of an inert gas or air.

[6] A method for manufacturing a semiconductor device provided with a porous material containing plural pores, which comprises:

applying the composition for gap formation according to any of claims 1 to 5 to coat said porous material so that said plural pores may be filled with said composition,

vaporizing a part or all of the solvent in said composition to form sacrifice areas made of a sacrificial material,

forming concave areas on the surface of said porous material,

filling said concave areas with a metal material so as to form metal wirings, and

removing said sacrificial material selectively so as to convert said sacrifice areas back into hollow gaps.

[7] The method according to claim 6, wherein said porous material has a porosity of 5 to 70%.

[8] The method according to claim 6 or 7, wherein the step of removing said sacrificial material is carried out in a manner where the material is decomposed by heating and thereby removed, where the material is removed by plasma treatment, where the material is removed by dissolving in a solvent, or where the material is removed by exposing to high-energy radiation.

[9] A semiconductor device manufactured by the method according to any of claims 6 to 8.