CLAIMS

1. A metal paste for joints, comprising:

metal particles; and

linear or branched monovalent aliphatic alcohol having 1 to 20 carbon atoms,

wherein the metal particles comprise sub-micro copper particles having a volume average particle diameter of 0.12 μm to 0.8 μm,

wherein the metal particles further comprise flake-shaped micro copper particles having a maximum diameter of 2 μm to 50 μm and an aspect ratio of greater than or equal to 3.0,

a content of the sub-micro copper particles is 30 mass% to 90 mass% on the basis of a total mass of the metal particles, and

a content of the micro copper particles is 10 mass% to 70 mass% on the basis of the total mass of the metal particles.

2. The metal paste for joints according to claim 1,

wherein a content of the monovalent aliphatic alcohol is 0.3 part by mass to 1.8 parts by mass with respect to 100 parts by mass of the metal particles.

3. The metal paste for joints according to any one of claims 1 to 2,

wherein the metal particles further comprise at least one type of metal particles selected from the group consisting of zinc and silver, at a content of 0.01 mass% to 10 mass% on the basis of the total mass of the metal particles.

4. The metal paste for joints according to any one of claims 1 to 3, comprising:

a solvent component at a content of 2 mass% to 50 mass% on

the basis of a total mass of the metal paste for joints.

5. The metal paste for joints according to claim 4,

wherein the solvent component comprises a solvent component having a boiling point of higher than or equal to 300°C, and

a content of the solvent component having a boiling point of higher than or equal to 300°C is 2 mass% to 50 mass% on the basis of the total mass of the metal paste for joints.

6. The metal paste for joints according to claim 5,

wherein the solvent component having a boiling point of higher than or equal to 300°C comprises at least one type selected from the group consisting of isobornyl cyclohexanol, tributyrin, butyl stearate, and octyl octanoate.

7. The metal paste for joints according to any one of claims 1 to 6, further comprising:

a carboxylic acid having carbon atoms of greater than or equal to 10,

wherein a content of the carboxylic acid is 0.07 part by mass to 2.10 parts by mass with respect to 100 parts by mass of the metal particles.

8. A production method for an assembly, the method comprising:

a step of preparing a laminated body in which a first member, the metal paste for joints according to any one of claims 1 to 7, and a second member are laminated in this order, and of sintering the metal paste for joints at a temperature of lower than or equal to 250°C in a state of receiving self-weight of the first member or in a state of receiving the self-weight of the first member and a pressure of less than

or equal to 0.01 MPa.

9. A production method for a semiconductor device, the method comprising:

a step of preparing a laminated body in which a first member, the metal paste for joints according to any one of claims 1 to 7, and a second member are laminated in this order, and of sintering the metal paste for joints at a temperature of lower than or equal to 250°C in a state of receiving self-weight of the first member or in a state of receiving the self-weight of the first member and a pressure of less than or equal to 0.01 MPa,

wherein at least one of the first member and the second member is a semiconductor element.

10. An assembly comprising:

a first member;

a second member; and

a sintered body of the metal paste for joints according to any one of claims 1 to 7, the sintered body joining the first member and the second member together.

11. The assembly according to claim 10,

wherein at least one of the first member and the second member comprises at least one type of metal selected from the group consisting of copper, nickel, silver, gold, and palladium, on a surface in contact with the sintered body.

12. A semiconductor device, comprising:

a first member;

a second member; and

a sintered body of the metal paste for joints according to any one of claims 1 to 7, the sintered body joining the first member and the second member together,

wherein at least one of the first member and the second member is a semiconductor element.