CLAIMS

1. A bonding wire for a semiconductor device comprising:

a Cu alloy core material; and

a Pd coating layer formed on a surface of the Cu alloy core material, wherein

the bonding wire contains at least one or more elements selected from Sb, Bi and Se,

a concentration of the elements in total is 0.1 ppm by mass or more and 100 ppm by mass or less relative to the entire wire, and

Sb ≤ 10 ppm by mass; and Bi ≤ 1 ppm by mass, and

the bonding wire contains at least one or more elements selected from Ni, Zn, Rh, In, Ir, Pt, Ga and Ge, and

a concentration of each of the elements is 0.011% by mass or more and 1.2% by mass or less relative to the entire wire.

2. A bonding wire for a semiconductor device comprising:

a Cu alloy core material; and

a Pd coating layer formed on a surface of the Cu alloy core material, wherein

the bonding wire contains at least one or more elements selected from Sb, Bi and Se, and

when containing Sb, a concentration of Sb is 2.2 ppm by mass or more and 10 ppm by mass or less relative to the entire wire,

when containing Bi, a concentration of Bi is 0.2 ppm by mass or more and 1 ppm by mass or less relative to the entire wire, and

when containing Se, a concentration of Se is 1.2 ppm by mass or more and 4.9 ppm by mass or less relative to the

entire wire.

3. The bonding wire for a semiconductor device according to claim 2, wherein

the bonding wire further contains at least one or more elements selected from Ni, Zn, Rh, In, Ir, Pt, Ga and Ge, and

a concentration of each of the elements is 0.011% by mass or more and 1.2% by mass or less relative to the entire wire.

4. The bonding wire for a semiconductor device according to any one of claims 1 to 3, wherein the concentration of the at least one or more elements selected from Sb, Bi and Se in total is 1 ppm by mass or more and 100 ppm by mass or less relative to the entire wire.

5. The bonding wire for a semiconductor device according to any one of claims 1 to 4, wherein a thickness of the Pd coating layer is 0.015 μm or more and 0.150 μm or less.

6. The bonding wire for a semiconductor device according to any one of claims 1 to 5, further comprising an alloy skin layer containing Au and Pd on the Pd coating layer.

7. The bonding wire for a semiconductor device according to claim 6, wherein a thickness of the alloy skin layer containing Au and Pd is 0.0005 μm or more and 0.050 μm or less.

8. The bonding wire for a semiconductor device according to any one of claims 1 to 7, wherein

the Cu alloy core material contains Pd, and

a concentration of Pd contained in the Cu alloy core material is 0.05% by mass or more and 1.2% by mass or less.

9. The bonding wire for a semiconductor device according to any one of claims 1 to 8, wherein

the bonding wire further contains at least one or more elements selected from B, P, Mg, Ca and La, and

a concentration of each of the elements is 1 ppm by mass or more and 100 ppm by mass or less relative to the entire wire.

10. The bonding wire for a semiconductor device according to any one of claims 1 to 9, wherein, in a measurement result when measuring crystal orientations on a surface of the bonding wire, a crystal orientation <111> angled at 15 degrees or less to a longitudinal direction of the bonding wire has a proportion of 30% or more and 100% or less.

11. The bonding wire for a semiconductor device according to any one of claims 1 to 10, wherein Cu is present at an outermost surface of the bonding wire.

12. The bonding wire for a semiconductor device according to any one of claims 1 to 11, wherein a concentration of Sb is 9.9 ppm by mass or less relative to the entire wire.