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 more than one element selected from As, Sn, 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

Sn ≤ 10 ppm by mass; Sb ≤ 10 ppm by mass; and Bi ≤ 1 ppm by mass.

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 more than one element selected from Te, Sn, 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

Sn ≤ 10 ppm by mass; Sb ≤ 10 ppm by mass; and Bi ≤ 1 ppm by mass.

3. The bonding wire for a semiconductor device according to claim 1 or 2, wherein the concentration of the elements in total is 1 ppm by mass or more and 100 ppm 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 a thickness of the Pd

coating layer is 0.015 μm or more and 0.150 μm or less.

5. The bonding wire for a semiconductor device according to any one of claims 1 to 4, further comprising an alloy skin layer containing Au and Pd on the Pd coating layer.

6. The bonding wire for a semiconductor device according to claim 5, wherein a thickness of the alloy skin layer containing Au and Pd is 0.0005 μm or more and 0.050 μm or less.

7. The bonding wire for a semiconductor device according to any one of claims 1 to 6, 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.

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 claim 1, wherein the bonding wire contains at least As selected from As, Sn, Sb, Bi and Se.

13. The bonding wire for a semiconductor device according to claim 2, wherein the bonding wire contains at least Te selected from Te, Sn, Sb, Bi and Se.