CLAIMS

1. A bonding wire for a semiconductor device containing one or more of In, Ga, and Cd for a total of 0.05 to 5 at%, and a balance being made up of Ag and incidental impurities.

2. The bonding wire for a semiconductor device according to claim 1, further containing one or more of Ni, Cu, Rh, Pd, Pt, and Au for a total of 0.01 to 5 at%.

3. The bonding wire for a semiconductor device according to claim 1 or 2, further containing one or more of Be, B, P, Ca, Y, La, and Ce for a total of 10 to 300 at ppm.

4. The bonding wire for a semiconductor device according to any one of claims 1 to 3, wherein a total atomic percentage of In, Ga, and Cd in a layer extending in a depth direction of 0 to 10 nm from a wire surface is equal to or larger than twice the same in a layer extending in the depth direction of 20 to 30 nm from the wire surface.

5. The bonding wire for a semiconductor device according to any one of claims 1 to 4, wherein an average grain size in a section in a direction perpendicular to a wire axis is 0.2 to 3.5 μm.

6. The bonding wire for a semiconductor device according to any one of claims 1 to 5, wherein in measurement results obtained by measuring crystal directions in a section of the bonding wire, the section containing a wire axis and being parallel to the wire axis, the ratio of a crystal direction <100> having an

angular difference of 15 degrees or less from a longitudinal direction of the bonding wire is between 30% and 100%, both inclusive, in terms of an area percentage.

7. The bonding wire for a semiconductor device according to any one of claims 1 to 6, wherein an average total atomic percentage of at least one or more elements selected from the group consisting of In, Ga, and Cd relative to a total of metallic elements in a layer extending in a depth direction of 0 to 1 nm from a wire surface is equal to or larger than 1.2 times the average total atomic percentage in a layer extending in a depth direction of 1 to 10 nm from the wire surface.

Claims

1. A bonding wire for ball bonding for a semiconductor device consisting of one or more of In, Ga, and Cd for a total of 0.05 to 5 at%, and a balance being made up of Ag and incidental impurities.

2. The bonding wire for ball bonding for a semiconductor device according to claim 1, further containing one or more of Ni, Cu, Rh, Pd, and Pt for a total of 0.01 to 5 at%.

3. The bonding wire for ball bonding for a semiconductor device according to claim 1 or 2, further containing one or more of Be, B, P, Ca, Y, La, and Ce for a total of 10 to 300 at ppm.

4. The bonding wire for ball bonding for a semiconductor device according to any one of claims 1 to 3, wherein a total atomic percentage of In, Ga, and Cd in a layer extending in a depth direction of 0 to 10 nm from a wire surface is equal to or larger than twice the same in a layer extending in the depth direction of 20 to 30 nm from the wire surface.

5. The bonding wire for ball bonding for a semiconductor device according to any one of claims 1 to 4, wherein an average grain size in a section in a direction perpendicular to a wire axis is 0.2 to 3.5 μm.

6. The bonding wire for ball bonding for a semiconductor device according to any one of claims 1 to 5, wherein in measurement results obtained by measuring crystal directions in a section of the bonding wire, the section containing a wire axis and being parallel to the

wire axis, the ratio of a crystal direction <100> having an angular difference of 15 degrees or less from a longitudinal direction of the bonding wire is between 30% and 100%, both inclusive, in terms of an area percentage.

7. The bonding wire for ball bonding for a semiconductor device according to any one of claims 1 to 6, wherein an average total atomic percentage of at least one or more elements selected from the group consisting of In, Ga, and Cd relative to a total of metallic elements in a layer extending in a depth direction of 0 to 1 nm from a wire surface is equal to or larger than 1.2 times the average total atomic percentage in a layer extending in a depth direction of 1 to 10 nm from the wire surface.