solution makes it possible to form a protective film on a nickel base coat in a state where no electric current is applied to the gold plating solution and to easily remove the protective film by the application of an electric current to the gold plating solution. Further, the present inventors have found that the presence of the protective film formed on the nickel base coat makes it possible to perform selective plating without causing a displacement reaction with the nickel base coat even when the gold plating solution comes into contact with the nickel base coat in a state where no electric current is applied. Further, the present inventors have found that the deposition of gold on the inner wall of a plating bath resulting from the generation of gold particles can also be inhibited because a displacement reaction with the nickel base coat does not occur. These findings have led to the completion of the present invention.

[0012a]

There is provided an electrolytic hard gold plating solution comprising 0.1 to 20 g/L of a gold cyanide salt; 0.01 to 10 g/L of a soluble cobalt salt and/or a soluble nickel salt; 10 to 200 g/L of an organic acid conductive salt; 1 to 50 g/L of a chelating agent; and 0.01 to 5 g/L of the displacement inhibitor for electrolytic hard gold plating solution comprising at least one compound selected from the group consisting of 2-mercapto-1-methylimidazole, a triazole compound having a mercapto group, and an aliphatic compound having a sulfonate group and a mercapto group.

[0013]

More specifically, in order to achieve the above object, the present invention includes the following aspects.

[0014]

[1] A displacement inhibitor for electrolytic hard gold plating solution, comprising at least one compound selected from the group consisting of an imidazole compound having a mercapto group, a triazole compound having a mercapto group, and an aliphatic compound having a sulfonate group and a mercapto group.

[0015]

[2] An electrolytic hard gold plating solution comprising:

a gold salt;

a soluble cobalt salt and/or a soluble nickel salt;

CLAIMS

1. An electrolytic hard gold plating solution comprising:

0.1 to 20 g/L of a gold cyanide salt;

0.01 to 10 g/L of a soluble cobalt salt and/or a soluble nickel salt;

10 to 200 g/L of an organic acid conductive salt;

1 to 50 g/L of a chelating agent; and

0.01 to 5 g/L of the displacement inhibitor for electrolytic hard gold plating solution comprising at least one compound selected from the group consisting of 2-mercapto-1-methylimidazole, a triazole compound having a mercapto group, and an aliphatic compound having a sulfonate group and a mercapto group.

2. The electrolytic hard gold plating solution according to claim 1, wherein the chelating agent is at least one selected from the group consisting of a carboxylic acid, an oxycarboxylic acid, and salts thereof.

3. The electrolytic hard gold plating solution according to claim 1 whose pH (25°C) is in a range of 3 to 7.