CLAIMS:

1. A coating fluid used to diffuse boron into a silicon substrate to form a p-type diffusion layer, comprising

0.5 to 4% by weight of a boron compound,

0.5 to 4% by weight of an organic binder,

0.5 to 5% by weight of a silicon compound,

0.5 to 8% by weight of an alumina precursor which is a compound capable of forming an alumina film upon heat treatment for boron diffusion, and

77 to 93% by weight of water and/or an organic solvent.

2. The coating fluid of claim 1 wherein the organic binder is polyvinyl alcohol, polyvinyl acetal or polyvinyl acetate.

3. The coating fluid of claim 1 or 2 wherein the silicon compound is silica.

4. The coating fluid of any one of claims 1 to 3 wherein the alumina precursor is aluminum hydroxide, aluminum chloride or aluminum chloride hexahydrate.

5. The coating fluid of any one of claims 1 to 4 wherein the alumina film inhibits outward diffusion of boron and enhances retention thereof during the heat treatment.

6. The coating fluid of any one of claims 1 to 5, having a viscosity of 80 to 140 mPa·s at 25°C.

7. A method of fabricating a semiconductor device, comprising the steps of:

applying the coating fluid of any one of claims 1 to 6 to a surface of a semiconductor substrate as a coating, and

heat treating the coating to form a boron doped p-type diffusion layer.

8. The method of claim 7 wherein the semiconductor device is a solar cell.

9. The method of claim 8, comprising the steps of:

providing a n-type silicon substrate with a texture,

applying the coating fluid to one surface of the silicon substrate as a coating,

heat treating the coating to form a boron doped p-type diffusion layer,

forming a n-type diffusion layer on the other surface of the silicon substrate,

forming an antireflective coating on each of the diffusion layers, wherein the antireflective coating is silicon nitride, silicon oxide, titanium dioxide, zinc oxide or tin oxide, and

forming electrodes.

10. A semiconductor device which is fabricated by the method of claim 7, wherein the boron doped p-type diffusion layer has the CV value of the sheet resistance of up to 10%.

11. A solar cell which is fabricated by the method of claim 8 or 9, wherein the boron doped p-type diffusion layer has the CV value of the sheet resistance of up to 10%.

CLAIMS:

1. A coating fluid used to diffuse boron into a silicon substrate to form a p-type diffusion layer, comprising a boron compound, an organic binder, a silicon compound, an alumina precursor, and water and/or an organic solvent.

2. The coating fluid of claim 1 wherein the boron compound is present in an amount of up to 4% by weight of the coating fluid.

3. The coating fluid of claim 1 wherein the organic binder is polyvinyl alcohol and present in an amount of up to 4% by weight of the coating fluid.

4. The coating fluid of claim 1 wherein the silicon compound is silica and present in an amount of up to 5% by weight of the coating fluid.

5. The coating fluid of claim 1 wherein the alumina precursor is a compound capable of forming alumina upon heat treatment and present in an amount of up to 8% by weight of the coating fluid.

6. The coating fluid of claim 1, having a viscosity of 80 to 140 mPa-s at 25°C.

7. A method of fabricating a semiconductor device using the coating fluid of any one of claims 1 to 6.

8. The method of claim 7 wherein the semiconductor device is a solar cell.

9. The method of claim 8, comprising the steps of:

providing a n-type silicon substrate with a texture,

applying the coating fluid of any one of claims 1 to 6 to one surface of the silicon substrate,

causing a p-type diffusion layer to form,

forming a n-type diffusion layer on the other surface of the silicon substrate,

forming an antireflective coating on each of the diffusion layers, and

forming electrodes.

10. A semiconductor device which is fabricated by the method of claim 7.

11. A solar cell which is fabricated by the method of claim 8 or 9.