properties without detriment to reliability and outer appearance, and a film-forming apparatus.

Solution to Problem

[0007]

Making extensive investigations to attain the above object, the inventors have found that by forming a passivation film and annealing thereafter, the passivation effect of the passivation film can be expanded to a reduction of the interface state density on surface and a reduction of recombination sites in the bulk of monocrystalline silicon solar cell, and further to a reduction of the series resistance of the solar cell. Thus electrical properties of the solar cell are improved. The invention is predicated on this finding.

In one aspect, there is provided a method for producing a solar cell, in the recited order, comprising the steps of:

forming an antireflection/passivation film on a semiconductor substrate,

annealing the substrate, wherein the annealing step is at 600°C to 900°C in an atmosphere of N_2 and

then forming electrodes on the substrate and firing the electrodes.

In another aspect, there is provided a film-forming apparatus for forming an antireflection/passivation film used in the method as defined above comprising means for forming the antireflection/passivation film and a heating chamber where the annealing step is carried out subsequent to formation of the antireflection/passivation film.

[0008]

~~Accordingly, the invention~~present disclosure provides a method for producing a solar cell and a film-forming apparatus, as defined below.

[1] A method for producing a solar cell, comprising the steps of:

forming an antireflection/passivation film on a semiconductor substrate,

annealing the substrate, and

then forming electrodes on the substrate.

[2] The method of [1], further comprising one or both of the step of forming a diffusion layer in the semiconductor substrate and the step of firing the electrodes.

[3] The method of [1] or [2], comprising the steps of forming a diffusion layer in the semiconductor substrate, then forming an antireflection/passivation film on the diffusion layer, then annealing the substrate, and thereafter forming electrodes, the step of forming electrodes including firing the electrodes.

[4] The method of [3] wherein the semiconductor substrate is of p-type, an n-type diffusion layer is formed on a light-receiving surface of the substrate, and the