CLAIMS

1. A method for producing an LED mounting substrate, the method comprising a step of cleaning an LED chip, being transferred from on top of a sapphire substrate onto a receptor substrate by laser lift-off, with an alkaline cleaning solution, wherein

a decomposition residue of a gallium nitride-based semiconductor generated by laser lift-off is present on a surface opposite to the receptor substrate of the LED chip that is transferred onto the receptor substrate,

a surface of the LED chip on a side to be adhered to the receptor substrate has a metal within a range of periods 3 to 5 and groups 11 to 14 of the periodic table, provided that the metal is not gallium,

a gap is formed between the LED chip and the receptor substrate, through which the alkaline cleaning solution can penetrate, and

the decomposition residue is removed in the step of cleaning.

2. The method for producing an LED mounting substrate according to claim 1, wherein

the gallium nitride-based semiconductor is GaN.

3. A method for producing an LED mounting substrate, the method comprising a step of cleaning an LED chip, being transferred from on top of a sapphire substrate onto a receptor substrate by laser lift-off, with an alkaline cleaning solution, wherein

a metal gallium is present on a surface opposite to the receptor substrate of the LED chip that is transferred onto the receptor substrate,

a surface of the LED chip on a side to be adhered to the receptor substrate has at least one metal selected from the group consisting of aluminum, copper, zinc, silver, indium, tin, and bismuth,

a gap is formed between the LED chip and the receptor substrate, through which the alkaline cleaning solution can penetrate, and

the metal gallium is removed in the step of cleaning.

4. The method for producing an LED mounting substrate according to any one of claims 1 to 3, wherein

an alkaline concentration of the alkaline cleaning solution is 0.5 mass% or more but no greater than a saturated concentration or less.

5. The method for producing an LED mounting substrate according to any one of claims 1 to 3, wherein

a temperature of the alkaline cleaning solution is 5°C or more and 80°C or less.

6. The method for producing an LED mounting substrate according to any one of claims 1 to 3, wherein

time for cleaning using the alkaline cleaning solution is 10 seconds or more and 1 hour or less.

7. The method for producing an LED mounting substrate according to any one of claims 1 to 3, wherein

a surface of the LED chip on a side to be adhered to the receptor substrate has a bump.

8. The method for producing an LED mounting substrate according to any one of claims 1 to 3, wherein

the LED chip transferred onto the receptor substrate is cleaned by immersing the LED chip along with the receptor substrate in the alkaline cleaning solution.

9. The method for producing an LED mounting substrate according to any one of claims 1 to 3, wherein

the alkaline cleaning solution has a pH ranging from 9.5 to 14.0.

10. The method for producing an LED mounting substrate according to any one of claims 1 to 3, wherein

the alkaline cleaning solution is an aqueous solution containing at least one selected from the group consisting of sodium hydroxide, potassium hydroxide, ammonium hydroxide, magnesium hydroxide, tetramethylammonium hydroxide, tetrabutylammonium hydroxide, sodium carbonate, sodium hydrogencarbonate, and potassium acetate.

11. The method for producing an LED mounting substrate according to any one of claims 1 to 3, wherein

an adhesive layer is provided on the surface of the receptor substrate on a side on which the LED chip is to be transferred.

12. The method for producing an LED mounting substrate according to claim 11, wherein

the receptor substrate is a quartz substrate provided with an adhesive layer on the surface.

13. A cleaning method for cleaning an LED chip transferred from a sapphire substrate onto a receptor

substrate by laser lift-off, wherein

the LED chip has a decomposition residue of a gallium nitride-based semiconductor generated by laser lift-off and a metal within a range of periods 3 to 5 and groups 11 to 14 of the periodic table on a surface, provided that the metal is not gallium, and

the decomposition residue is removed by cleaning such that the alkaline cleaning solution comes in contact with the decomposition residue and the metal.

14. A cleaning method for cleaning an LED chip transferred from a sapphire substrate onto a receptor substrate by laser lift-off, wherein

the LED chip has a gallium and at least one metal selected from the group consisting of aluminum, copper, zinc, silver, indium, tin, and bismuth on a surface, and

the gallium is removed by cleaning such that the alkaline cleaning solution comes in contact with the gallium and the metal.

15. The cleaning method according to claim 14, wherein

a gap is formed between the LED chip and the receptor substrate, through which the alkaline cleaning solution can penetrate.

16. The cleaning method according to claim 14 or 15, wherein

the metal contains at least one selected from the group consisting of copper, silver, indium, and tin.

17. The cleaning method according to claim 14 or 15, wherein

the metal contains copper, silver, and tin.