CLAIMS

1. A method for recovering lithium, for recovering lithium from a lithium ion secondary battery, the method comprising:

thermally treating a lithium ion secondary battery having a residual voltage higher than or equal to 80% of a rated voltage which is placed in a storing container, to obtain a thermally treated product;

pulverizing the thermally treated product, to obtain a pulverized product; and

recovering lithium from the pulverized product.

2. The method for recovering lithium according to claim 1,

wherein the thermally treating includes heating the lithium ion secondary battery to 350°C or higher and 550°C or lower.

3. The method for recovering lithium according to claim 2,

wherein in the thermally treating, an amount of heat supply when the lithium ion secondary battery is igniting is changed to lower than or equal to 50% of an amount of heat supply before the lithium ion secondary battery ignites.

4. The method for recovering lithium according to claim 2 or 3,

wherein in the thermally treating, after the lithium ion secondary battery finishes igniting, the lithium ion secondary battery is further thermally treated at 750°C or higher and lower than 1,085°C.

5. The method for recovering lithium according to any one of claims 1 to 4,

wherein the storing container includes an opening through which a gas is circulatable.

6. The method for recovering lithium according to claim 5,

wherein the storing container includes an openable and closable lid for storing the lithium ion secondary battery.

7. The method for recovering lithium according to claim 5 or 6,

wherein a melting point of the storing container is higher than a temperature at which the lithium ion secondary battery is thermally treated.

8. The method for recovering lithium according to any one of claims 5 to 7,

wherein in the thermally treating, the lithium ion secondary battery is thermally treated in a manner that a flame for thermally treating the lithium ion secondary battery does not contact the storing container.

9. The method for recovering lithium according to claim 8,

wherein in the thermally treating, the lithium ion secondary battery is thermally treated in a manner that the flame for thermally treating the lithium ion secondary battery is not radiated in a direction toward the storing container.

10. The method for recovering lithium according to any one of claims 1 to 9, comprising after the pulverizing,

classifying the pulverized product, to obtain a coarse-grained product and a fine-grained product,

wherein in the recovering lithium, lithium is recovered from the fine-grained product.

11. The method for recovering lithium according to any one of claims 1 to 10,

wherein in the recovering lithium, the pulverized product is immersed in water, to obtain a leaching liquid containing lithium.

12. The method for recovering lithium according to claim 11,

wherein in the recovering lithium, the leaching liquid is filtrated, to perform solid-liquid separation of the leaching liquid into a solution containing lithium, and a residue.

13. The method for recovering lithium according to claim 11,

wherein in the recovering lithium, the leaching liquid is subjected to wet magnetic sorting, to sort the leaching liquid into a slurry containing lithium and non-magnetically attractable materials, and magnetically attractable materials

containing either or both of cobalt and nickel.

14. The method for recovering lithium according to claim 13,

wherein in the recovering lithium, the slurry is filtrated, to perform solid-liquid separation of the slurry into a solution containing lithium, and a residue containing the non-magnetically attractable materials.

15. The method for recovering lithium according to claim 14,

wherein in the recovering lithium, calcium hydroxide is added to the solution in order that fluorine contained in the solution is solidified in a form of calcium fluoride, and the solution is subsequently filtrated to perform solid-liquid separation to remove fluorine from the solution.

16. The method for recovering lithium according to claim 15,

wherein in the recovering lithium, carbon dioxide is added to the solution from which fluorine has been removed in order that calcium contained in the solution is solidified in a form of calcium carbonate, and the solution is subsequently filtrated to perform solid-liquid separation to remove calcium from the solution.

17. The method for recovering lithium according to claim 16,

wherein in the recovering lithium, the solution from which calcium has been removed is heated, to recover lithium carbonate.

18. A method for processing a lithium ion secondary battery, the method comprising:

thermally treating a lithium ion secondary battery having a residual voltage higher than or equal to 80% of a rated voltage which is placed in a storing container, to obtain a thermally treated product.

19. The method for processing a lithium ion secondary battery according to claim 18,

wherein the thermally treating includes heating the lithium ion secondary

battery to 350°C or higher and 550°C or lower.

20. The method for processing a lithium ion secondary battery according to claim 19,

wherein in the thermally treating, an amount of heat supply when the lithium ion secondary battery is igniting is changed to lower than or equal to 50% of an amount of heat supply before the lithium ion secondary battery ignites.

21. The method for processing a lithium ion secondary battery according to claim 19 or 20,

wherein in the thermally treating, after the lithium ion secondary battery finishes igniting, the lithium ion secondary battery is further thermally treated at 750°C or higher and lower than 1,085°C.

22. The method for processing a lithium ion secondary battery according to claim 21,

wherein the lithium ion secondary battery includes an exterior case containing aluminum, and

in the thermally treating, the exterior case is melted, to recover aluminum.

23. The method for processing a lithium ion secondary battery according to any one of claims 18 to 22,

wherein the storing container includes an opening through which a gas is circulatable.

24. The method for processing a lithium ion secondary battery according to claim 23,

wherein the storing container includes an openable and closable lid for storing the lithium ion secondary battery.

25. The method for processing a lithium ion secondary battery according to claim 23 or 24,

wherein a melting point of the storing container is higher than a

temperature at which the lithium ion secondary battery is thermally treated.

26. The method for processing a lithium ion secondary battery according to any one of claims 23 to 25,

wherein in the thermally treating, the lithium ion secondary battery is thermally treated in a manner that a flame for thermally treating the lithium ion secondary battery does not contact the storing container.

27. The method for processing a lithium ion secondary battery according to claim 26,

wherein in the thermally treating, the lithium ion secondary battery is thermally treated in a manner that the flame for thermally treating the lithium ion secondary battery is not radiated in a direction toward the storing container.

28. The method for processing a lithium ion secondary battery according to any one of claims 18 to 27, further comprising:

pulverizing the thermally treated product, to obtain a pulverized product; and

classifying the pulverized product, to obtain a coarse-grained product and a fine-grained product.

29. The method for processing a lithium ion secondary battery according to claim 28,

wherein in the classifying, copper is recovered into the coarse-grained product.

30. The method for processing a lithium ion secondary battery according to claim 28 or 29, further comprising

immersing the fine-grained product in water, to obtain a leaching liquid containing lithium.

31. The method for processing a lithium ion secondary battery according to claim 30, further comprising

subjecting the leaching liquid to wet magnetic sorting, to sort the leaching liquid into a slurry containing lithium and non-magnetically attractable materials, and magnetically attractable materials containing either or both of cobalt and nickel.

32. The method for processing a lithium ion secondary battery according to any one of claims 18 to 31,

wherein a percentage of nickel in a positive electrode active substance of the lithium ion secondary battery is 75% or greater.