WHAT IS CLAIMED IS:

1. An ultrafine bubble generating method, comprising:

a pre-processing step of performing a predetermined pre-processing on a liquid; and

a generating step of generating ultrafine bubbles smaller than 1.0 μm in diameter by causing a heating element , which is provided in the liquid on which the pre-processing is performed, to generate heat to generate film boiling on an interface between the liquid and the heating element, and

wherein the pre-processing step includes first processing for removing an inorganic ion from the liquid by using a cation exchange resin.

2. The ultrafine bubble generating method according to claim 1, wherein

the pre-processing step includes second processing for degassing the liquid.

3. The ultrafine bubble generating method according to claim 1, wherein

the pre-processing step includes third processing for dissolving a predetermined gas into the liquid.

4. The ultrafine bubble generating method according to claim 1, wherein

the pre-processing step includes first processing for removing an impurity from the liquid, second processing for degassing the liquid after the first processing is performed thereon, and third processing for dissolving a predetermined gas into the liquid after the second processing is performed thereon.

5. The ultrafine bubble generating method according to claim 3 or 4, wherein

the predetermined gas is selected from hydrogen, helium, oxygen, nitrogen, methane, fluorine, neon, carbon dioxide, ozone, argon, chlorine, ethane, propane, air, and a mixed gas containing these.

6. The ultrafine bubble generating method according to claim 3 or 4, wherein

in the third processing, a pressurizing and dissolving method is used to dissolve the predetermined gas into the liquid to achieve a saturated solubility.

7. The ultrafine bubble generating method according to any one of claims 3 to 5, wherein

the predetermined gas contains an ozone gas, and

the pre-processing step further includes a step of generating the ozone gas by using at least one of a discharge method, an electrolysis method, and an ultraviolet ray lamp method.

8. The ultrafine bubble generating method according to claim 7, wherein

in the third processing, the ozone gas is dissolved into the liquid by using at least one of a pressurizing and dissolving method, an air bubble dissolving method, a film dissolving method, and a packed-bed dissolving method.

9. The ultrafine bubble generating method according to claim 2 or 4, wherein

in the second processing, a gas part included in a container storing the liquid is depressurized to gasify a solute contained in the liquid and discharge the solute from the container.

10. The ultrafine bubble generating method according to claim 1 or 4, wherein

the first processing includes processing for removing a negative ion by using an anion exchange resin.

11. The ultrafine bubble generating method according to claim 1 or 4, wherein

the first processing includes processing for removing an organic substance by using a filtration filter.

12. The ultrafine bubble generating method according to claim 1 or 4, wherein

the first processing includes processing for removing an insoluble solid substance by using the precipitation characteristics of the insoluble solid substance.

13. The ultrafine bubble generating method according to any one of claims 1 to 12, wherein

the pre-processing step and the generating step are performed repeatedly on the liquid.

14. The ultrafine bubble generating method according to any one of claims 1 to 13, further comprising:

a collecting step of collecting an ultrafine bubble-containing liquid containing the ultrafine bubbles generated in the generating step.

15. The ultrafine bubble generating method according to any one of claims 1 to 14, further comprising:

a removing step of removing an impurity from an ultrafine bubble-containing liquid containing the ultrafine bubbles generated in the generating step, after the generating step; and

performing the pre-processing step again after performing the removing step.

16. An ultrafine bubble generation apparatus comprising:

a pre-processing unit configured to perform a predetermined pre-processing on a liquid; and

a generating unit configured to generate ultrafine bubbles smaller than 1.0 μm in diameter by causing a heating element, which is provided in the liquid on which the pre-processing is performed, to generate heat to generate film boiling on an interface between the liquid and the heating element, and wherein the pre-processing unit includes a removal unit that removes an inorganic ion by using a cation exchange resin.

17. The ultrafine bubble generation apparatus according to claim 16, wherein

the pre-processing unit includes a degassing unit that degasses the liquid.

18. The ultrafine bubble generation apparatus according to claim 16, wherein

the pre-processing unit includes a dissolving unit that dissolves a predetermined gas into the liquid.

19. The ultrafine bubble generation apparatus according to claim 16, wherein

the pre-processing unit includes a removal unit that removes an impurity from the liquid, a degassing unit that degasses the liquid after the processing is performed thereon by the removal unit, and a dissolving unit that dissolves a predetermined gas into the liquid after the processing is performed thereon by the degassing unit.

20. The ultrafine bubble generation apparatus according to any one of claims 16 to 17, wherein

the generating unit includes a chamber storing the liquid on which the predetermined pre-processing is performed by the pre-processing unit, the heating

element provided in the chamber, a driving unit that drives the heating element, and a dissolving unit that dissolves a predetermined gas into the liquid stored in the chamber.

21. The ultrafine bubble generation apparatus according to any one of claims 18 to 20, wherein

the predetermined gas is selected from hydrogen, helium, oxygen, nitrogen, methane, fluorine, neon, carbon dioxide, ozone, argon, chlorine, ethane, propane, air, and a mixed gas containing these.

22. The ultrafine bubble generation apparatus according to any one of claims 18 to 20, wherein

the dissolving unit uses a pressurizing and dissolving method to dissolve the predetermined gas into the liquid to achieve a saturated solubility.

23. The ultrafine bubble generation apparatus according to any one of claims 18 to 20, wherein

the predetermined gas contains an ozone gas, and

the pre-processing unit generates the ozone gas by using at least one of a discharge method, an electrolysis method, and an ultraviolet ray lamp method.

24. The ultrafine bubble generation apparatus according to claim 23, wherein

the dissolving unit dissolves the ozone gas into the liquid by using at least one of a pressurizing and dissolving method, an air bubble dissolving method, a film dissolving method, and a packed-bed dissolving method.

25. The ultrafine bubble generation apparatus according to claim 17 or 19, wherein

the degassing unit depressurizes a gas part included in a container storing the liquid to gasify a solute contained in the liquid and discharge the solute from the container.

26. The ultrafine bubble generation apparatus according to claim 16 or 19, wherein the removal unit removes a negative ion by using an anion exchange resin.

27. The ultrafine bubble generation apparatus according to claim 16 or 19, wherein the removal unit removes an organic substance by using a filtration filter.

28. The ultrafine bubble generation apparatus according to claim 16 or 19, wherein the removal unit removes an insoluble solid substance by using the precipitation characteristics of the insoluble solid substance.

29. The ultrafine bubble generation apparatus according to any one of claims 16 to 28, further comprising:

a unit that supplies an ultrafine bubble-containing liquid containing the ultrafine bubbles generated by the generating unit to the pre-processing unit again.

30. The ultrafine bubble generation apparatus according to any one of claims 16 to 29, further comprising:

a post-processing unit that removes an impurity from an ultrafine bubble-containing liquid containing the ultrafine bubbles generated by the generating unit; and

a circulation route through which the liquid processed by the post-processing unit is supplied to the pre-processing unit.

31. The ultrafine bubble generation apparatus according to any one of claims 16 to 30, further comprising:

a unit that collects an ultrafine bubble-containing liquid containing the ultrafine bubbles generated by the generating unit.