What is claimed:

1. An ozonated water delivery system, comprising:

at least one contacting device;

at least one ultrapure water source configured to provide ultrapure water;

at least one ultrapure water conduit coupled to the at least one ultrapure water source;

at least one solution conduit in communication with the at least one contacting device and the at least one ultrapure water source via the at least one ultrapure water conduit;

at least one gas source containing at least one gas in communication with at least one of the at least one ultrapure water source, the at least one ultrapure water conduit, and the at least one solution conduit, wherein the at least one gas ~~forming~~ forms at least one solution when reacted with the ultrapure water; and wherein the at least one solution is provided to the contacting device through the solution conduit;

at least one mixed gas conduit in communication with the at least one gas source and the at least one contacting device, the at least one mixed gas conduit configured to provide at least one mixed gas including ozone to the at least one contacting device; and

at least one ozonated water output conduit in communication with the at least one contacting device.

2. The ozonated water delivery system of claim 1 wherein the contacting device comprises at least one packed column contacting device.

3. The ozonated water delivery system of claim 1 wherein the contacting device comprises at least one pack column contacting device including tower packing therein.

4. The ozonated water delivery system of claim 1 wherein the contacting device comprises at least one membrane-based contacting device having at least one membrane module therein.

5. The ozonated water delivery system of claim 1 wherein the at least one gas source is configured to provide carbon dioxide to at least one of the at least one ultrapure water source,

the at least one ultrapure water conduit, and the at least one solution conduit, thereby forming an aqueous carbon dioxide solution.

6. The ozonated water delivery system of claim 5 wherein the at least one gas source is configured to flow carbon dioxide to at least one ultrapure water source, the at least one ultrapure water conduit, and the at least one solution conduit at a flow rate of about 0.01 SLPM to about 0.5 SLPM.

7. The ozonated water delivery system of claim 5 wherein the at least one gas source is configured to flow carbon dioxide to at least one ultrapure water source, the at least one ultrapure water conduit, and the at least one solution conduit at a flow rate of about 0.05 SLPM to about 0.3 SLPM.

8. The ozonated water delivery system of claim 5 wherein the at least one gas source is configured to flow carbon dioxide to at least one ultrapure water source, the at least one ultrapure water conduit, and the at least one solution conduit at a flow rate of about 0.1 SLPM to about 0.2 SLPM.

9. The ozonated water delivery system of claim 5 wherein the at least one gas source is configured to flow carbon dioxide to at least one ultrapure water source, the at least one ultrapure water conduit, and the at least one solution conduit at a fixed gas flow rate.

10. The ozonated water delivery system of claim 5 wherein the at least one gas source is configured to flow carbon dioxide to at least one ultrapure water source, the at least one ultrapure water conduit, and the at least one solution conduit at a variable gas flow rate.

11. The ozonated water delivery system of claim 1 wherein at least one mixed gas flowing from the at least one gas source to the at least one contacting device via the at least one mixed gas conduit is comprised of oxygen, ozone, and carbon dioxide.

12. The ozonated water delivery system of claim 11 wherein at least one mixed gas flowing from the at least one gas source to the at least one contacting device via the at least one mixed gas conduit may include at least one gas selected from the group nitrogen, nitrogen dioxide, and dinitrogen dioxide.

13. The ozonated water delivery system of claim 1 further comprising at least one of a processor, valve, mass flow controller, flow sensor, gauge, indicator, flow restrictor, and sensor positioned on at least one of the at least one gas source, at least one ultrapure water source, at least one ultrapure water conduit, at least one solution conduit, at least one mixed gas conduit, at least ozonated water outlet conduit.

14. The ozonated water delivery system of claim 1 further comprising:

at least one ultrapure water inlet formed on the contacting device and in communication with the at least one ultrapure water source via at least one of the at least one ultrapure water conduit and at least one solution conduit; and

at least one mixed gas inlet formed thereon on the contacting device and in communication with the at least one gas source via the at least one mixed gas conduit.

15. The ozonated water delivery system of claim 14 wherein the at least one mixed gas inlet is located distally from the at least one ultrapure water inlet.

16. The ozonated water delivery system of claim 14 wherein the at least one mixed gas inlet is located adjacent to the at least one ultrapure water inlet.

17. The ozonated water delivery system of claim 1 wherein the at least ozonated water outlet conduit is configured to output ozonated water.

18. The ozonated water delivery system of claim 1 wherein the at least ozonated water outlet conduit is configured to output ozonated water at a rate of 0.2 liter per minute to 70 liters per minute.

19. The ozonated water delivery system of claim 1 wherein the at least ozonated water outlet conduit is configured to output ozonated water at a rate of 3 liters per minute to 40 liters per minute.

20. The ozonated water delivery system of claim 1 wherein the at least ozonated water outlet conduit is configured to output ozonated water at a rate of 2 liters per minute to 20 liters per minute.

21. An ozonated water delivery system, comprising:

a first contacting device;

at least one ultrapure water source configured to provide ultrapure water to the first contacting device;

at least one ultrapure water conduit coupled to the at least one ultrapure water source and the first contacting device;

at least one solution conduit in communication with the first contacting device and the at least one ultrapure water source via the at least one ultrapure water conduit;

at least one gas source containing at least one gas in communication with at least one of the at least one ultrapure water source, the at least one ultrapure water conduit, and the at least one solution conduit, wherein the at least one gas ~~forming~~ forms at least one solution when reacted with the ultrapure water; and wherein the at least one solution is provided to the contacting device through the solution conduit;

at least a second contacting device in communication with the first contacting device via at least one first contacting device conduit, the first contacting device conduit configured to transport ozonated water outputted from the first contacting device to the at least a second contacting device;

at least one mixed gas conduit in communication with the at least one gas source and the at least a second contacting device, the at least one mixed gas conduit configured to provide at least one mixed gas including ozone to the at least a second contacting device;

at least one off gas conduit ~~is~~ in communication with the at least a second contacting device and the first contacting device, the at least one off gas conduit configured to direct a portion of the at least one mixed gas from the at least a second contacting device to the first contacting device; and

at least one ozonated water output conduit in communication with the at least a second contacting device.

22. The ozonated water delivery system of claim 21 wherein the at least one of the first contacting device and the at least a second contacting device comprises at least one packed column contacting device.

23. The ozonated water delivery system of claim 21 wherein the at least one of the first contacting device and the at least a second contacting device comprises at least one pack column contacting device including tower packing therein.

24. The ozonated water delivery system of claim 21 wherein the at least one of the first contacting device and the at least a second contacting device comprises at least one membrane-based contacting device having at least one membrane module therein.

25. The ozonated water delivery system of claim 21 further comprising at least one pump in communication with the first contacting device and the at least a second contacting device, the at least one pump configured to pump ozonated water outputted from the first contacting device to the at least a second contacting device.

26. The ozonated water delivery system of claim 21 wherein the at least one gas source is configured to provide carbon dioxide to at least one of the at least one ultrapure water source,

the at least one ultrapure water conduit, and the at least one solution conduit, thereby forming an aqueous carbon dioxide solution.

27. The ozonated water delivery system of claim 26 wherein the at least one gas source is configured to flow carbon dioxide to at least one ultrapure water source, the at least one ultrapure water conduit, and the at least one solution conduit at a flow rate of about 0.01 SLPM to about 0.5 SLPM.

28. The ozonated water delivery system of claim 21 wherein at least one mixed gas flowing from the at least one gas source to the at least a second contacting device via the at least one mixed gas conduit is comprised of oxygen, ozone, and carbon dioxide.

29. The ozonated water delivery system of claim 21 wherein at least one mixed gas flowing from the at least one gas source to the at least a second contacting device via the at least one mixed gas conduit may include at least one gas selected from the group nitrogen, nitrogen dioxide, and dinitrogen dioxide.

30. The ozonated water delivery system of claim 21 further comprising at least one of a processor, valve, mass flow controller, flow sensor, gauge, indicator, flow restrictor, pump, and sensor positioned on at least one of the at least one gas source, at least one ultrapure water source, at least one ultrapure water conduit, at least one solution conduit, a least one first contacting device conduit, at least one mixed gas conduit, at least one off gas coupling conduit, and at least ozonated water outlet conduit.

31. A method of providing ozonated water, comprising:

forming an aqueous carbon dioxide solution comprised of carbon dioxide dissolved in ultrapure water;

flowing the aqueous carbon dioxide solution through a solution conduit into at least one contacting device;

flowing at least one mixed gas having at least a portion of which comprising ozone into the at least one contacting device having the aqueous carbon dioxide solution flowing therein;

dissolving at least a portion of the ozone within the ultrapure water within the at least one contacting device;

delaying the rate of ozone decay of the dissolved ozone within the ultrapure water with the carbon dioxide constituent of the aqueous carbon dioxide solution; and

outputting ozonated water from the at least one contacting device.