Claims:

1. A method for producing a hypochlorite-containing product solution with a chlorate to free available chlorine (FAC) ratio of from 0.005 to 0.1, comprising:

   - contacting a flow of a chloride-containing brine to an aqueous feed stream so as to give rise to an admixture,

     the flow of chloride-containing brine having a flow rate,

     the flow of chloride-containing brine having a chloride concentration,

     the admixture having a chloride concentration, and

     the chloride concentration of at least one of the chloride-containing brine and of the admixture optionally being in the range of from 200 to 2500 mmol/L;

   - passing the admixture through a continuous electrolysis cell, the continuous electrolysis cell having an anode and a cathode disposed therein and separated by a fluid path such that the admixture passes between the anode and cathode so as to give rise to the hypochlorite-containing product solution; and

   - modulating at least one of the flow rate of the chloride-containing brine and the chloride concentration of the chloride-containing brine so as produce the hypochlorite-containing product solution with a chlorate to FAC ratio of from 0.005 to 0.1.

2. The method according to claim 1, further comprising modulating at least one of the flow rate of the chloride-containing brine and the chloride concentration of the chloride-containing brine so as to (i) maintain an essentially constant electrolysis plate-to-plate voltage within the continuous electrolysis cell, or (ii) maintain an essentially constant current supplied within the continuous electrolysis cell.

3. The method according to any one of claims 1-2, further comprising modulating a current supplied within the continuous electrolysis cell so as to maintain an essentially constant electrolysis plate-to-plate voltage within the continuous electrolysis cell; or modulating a plate-to-plate voltage within the continuous electrolysis cell so as to maintain an essentially constant current supplied within the continuous electrolysis cell.

4. The method according to any one of claims 1-2, wherein the hypochlorite-containing solution has a chlorate to FAC ratio of less than 0.075.

5. The method according to claim 4, wherein the hypochlorite-containing solution has a chlorate to FAC ratio of less than 0.025.

6. The method according to claim 5, wherein the hypochlorite-containing solution has a chlorate to FAC ratio of less than 0.010.

7. The method according to any one of claims 1-2, wherein at least one of the chloride-containing brine and the admixture has a chloride concentration of from 250 to 2500 mmol/L.

8. The method according to claim 7, wherein at least one of the chloride-containing brine and the admixture has a chloride concentration of at least 500 mmol/L.

9. The method according to claim 8, wherein at least one of the chloride-containing brine and the admixture has a chloride concentration of at least 1000 mmol/L.

10. The method according to claim 9, wherein at least one of the chloride-containing brine and the admixture has a chloride concentration of at least 1500 mmol/L.

11. The method according to claim 10, wherein at least one of the chloride-containing brine and the admixture has a chloride concentration of at least 2000 mmol/L.

12. The method according to any one of claims 1-2, wherein the chloride-containing brine comprises sodium chloride.

13. The method according to any one of claims 1-2, wherein the continuous electrolysis cell has a plate-to-plate voltage of less than or equal to 8 volts, less than or equal to 7 volts, less than or equal to 6 volts, less than or equal to 5.5 volts, or less than or equal to 5 volts.

14. The method according to any one of claims 1-2, wherein the concentration of hypochlorite present in the hypochlorite-containing product solution is from 500 mg/L to 10,000 mg/L.

15. The method according to any one of claims 1-2, wherein at least one of the chloride-containing brine and the admixture has a pH in the range of from 6 to 10.

16. The method according to any one claims 1-2, wherein the admixture has an average residence time in the electrolysis cell of from 30 to 600 seconds.

17. The method according to any one of claims 1-2, wherein the electrolysis cell comprises an intermediate electrode.

18. The method according to any one of claims 1-2, wherein the electrolysis cell is used in an on-site generation system.

19. The method according to any one of claims 1-2, wherein the electrolysis cell comprises a control system and comprises one or more sensors on an inlet or outlet of the electrolysis cell, wherein the control system is configured to modulate at least one of the flow rate of the chloride-containing brine, the plate-to-plate voltage within the continuous electrolysis cell, the current supplied within the continuous electrolysis cell, or the chloride concentration of the chloride-containing brine, in response to a signal collected by the one or more sensors.

20. The method according to claim 5, wherein the hypochlorite-containing solution has a chlorate to FAC ratio of less than 0.010, wherein at least one of the chloride-containing brine and the admixture has a chloride concentration of at least 500 mmol/L, and wherein the continuous electrolysis cell has a plate-to-plate voltage of less than or equal to 8 volts.

21. A method, comprising:

contacting a flow of a chloride-containing brine to an aqueous feed stream so as to form an admixture,

the chloride-containing brine having therein a concentration of chloride,

the admixture having therein a concentration of chloride;

passing the admixture through a continuous electrolysis cell, the continuous electrolysis cell having an anode and a cathode disposed therein and separated by a fluid path such that the admixture passes between the anode and cathode so as to give rise to a hypochlorite-containing product solution,

the continuous electrolysis cell optionally (i) operating at an essentially constant plate-to-plate voltage therein, or (ii) operating at an essentially constant current therein; and

identifying a characteristic of the flow rate of the chloride-containing brine that gives rise to the hypochlorite-containing product solution having a chlorate to FAC ratio of from 0.005 to 0.1 and selecting and setting operating parameters to achieve the identified characteristic, wherein the characteristic of the flow of the chloride-containing brine is at least one of (i) a concentration of chloride in the chloride-containing brine, and (ii) a flow rate of the chloride-containing brine.

22. The method of claim 21, comprising identifying a characteristic of the flow of the chloride-containing brine that gives rise to the hypochlorite-containing product solution having a chlorate to FAC ratio of from 0.005 to 0.05.

23. The method of claim 22, comprising identifying a characteristic of the flow of the chloride-containing brine that gives rise to the hypochlorite-containing product solution having a chlorate to FAC ratio of from 0.005 to 0.03.

24. A system, comprising:
a continuous electrolysis cell configured to receive an admixture that comprises a flow of chloride-containing brine and an aqueous feed,

the continuous electrolysis cell having an anode and a cathode disposed therein such that the admixture passes between the anode and cathode,

the flow of chloride-containing brine having therein a chloride concentration and a flow rate,

the electrolysis cell being configured to output a hypochlorite-containing product solution having a chlorate to FAC ratio of from 0.005 to 0.1,

the system being configured to modulate at least one of the flow rate of the chloride-containing brine and the chloride concentration of the chloride-containing brine so as produce the hypochlorite-containing product solution with a chlorate to FAC ratio of from 0.005 to 0.1,

the system optionally being configured to (i) modulate at least one of the flow rate of the chloride-containing brine and the chloride concentration of the chloride-containing brine to as to maintain an essentially constant plate-to-plate voltage within the continuous electrolysis cell, (ii) modulate at least one of the flow rate of the chloride-containing brine and the chloride concentration of the chloride-containing brine so as to maintain an essentially constant current supplied within the continuous electrolysis cell, or (i) and (ii).

25. The system of claim 24, further comprising a sensor train that comprises a sensor configured to monitor one or more characteristics of the hypochlorite-containing product solution, wherein the sensor train comprises a module configured to adjust one or more parameters of the electrolysis cell in response to a signal from the sensor, wherein the electrolytic cell operates at a plate-to-plate voltage of less than or equal to 12 volts.

26. The system of claim 25, wherein the electrolytic cell operates at a plate-to-plate voltage of less than or equal to 10 volts.

27. The system of claim 26, wherein the electrolytic cell operates at a plate-to-plate voltage of 2 to 8 volts.

28. The system of any one of claims 24-27, wherein at least one of the chloride-containing brine and the admixture has a chloride concentration of from 40 mmol/L to 5000 mmol/L, wherein the electrolytic cell comprises an anode, a cathode, and optionally one or more intermediate electrodes, wherein the hypochlorite-containing

product solution is characterized by a hypochlorite concentration of greater than 500 mg/L.