Claims

1. Multiple batch system for the preparation of a solution of calcium hydrogen carbonate, the multiple batch system comprising
   a) at least one dosing unit,
   b) a master batch line comprising in circular communication
      i) at least one gas dosing inlet,
      ii) at least one mixing unit provided with at least one inlet and at least one outlet, and
      iii) at least one tank provided with at least one inlet and at least one outlet,
   c) at least one slave batch line comprising in circular communication
      i) at least one gas dosing inlet,
      ii) at least one mixing unit provided with at least one inlet and at least one outlet, and
      iii) at least one tank provided with at least one inlet and at least one outlet,

   wherein the master batch line and the at least one slave batch line are independently connected to the at least one dosing unit.

2. Multiple batch system of claim 1, wherein the at least one dosing unit is connected to a water reservoir and a storage container for solid material.

3. Multiple batch system according to claim 1 or 2, wherein the at least one gas dosing inlet of the master batch line and/or the at least one slave batch line is located before the at least one mixing unit.

4. Multiple batch system according to any one of the preceding claims, wherein the master batch line and/or the at least one slave batch line comprises one mixing unit, preferably at least two mixing units, more preferably at least two mixing units connected in series.

5. Multiple batch system according to any one of the preceding claims, wherein the at least one mixing unit of the master batch line and/or the at least one slave batch line is a vertical and/or horizontal mixing unit, preferably a vertical mixing unit.

6. Multiple batch system according to any one of the preceding claims, wherein the at least one mixing unit of the master batch line and/or the at least one slave batch line is at least one static mixer.

7. Multiple batch system according to any one of the preceding claims, wherein the at least one mixing unit of the master batch line and/or the at least one slave batch line is located between the at least one gas dosing inlet and the at least one tank.

8. Multiple batch system according to any one of claims 1 to 5, wherein the at least one mixing unit of the master batch line and/or the at least one slave batch line is at least one dynamic mixer.

9. Multiple batch system according to claim 8, wherein the at least one mixing unit of the master batch line and/or the at least one slave batch line is located between the at least one gas dosing inlet and the at least one tank or integrated in the at least one tank.

10. Multiple batch system according to any one of the preceding claims, wherein the master batch line comprises at least one control unit monitoring the pH, turbidity, conductivity, temperature and/or calcium ion concentration (e.g. by ion sensitive electrode).

11. Multiple batch system according to any one if the preceding claims, wherein the multiple batch system further comprises at least one membrane filtration

unit, preferably a cross flow or dead-end membrane microfiltration device and/or a cross flow or dead-end membrane ultrafiltration device.

12. Use of a solution of calcium hydrogen carbonate being prepared in a multiple batch system according to any one of claims 1 to 11 for the remineralization of desalinated or naturally soft water.

13. Use of a multiple batch system according to any one of claims 1 to 11 for the remineralization of desalinated or naturally soft water.

14. Use according to claim 12 or 13, wherein the desalinated or naturally soft water is selected from distilled water, industrial water, desalinated water, brackish water or brine, treated wastewater or natural water such as ground water, surface water or rainfall.

15. Use of a multiple batch system according to any one of claims 1 to 11 for the continuous preparation of a solution of calcium hydrogen carbonate.

16. Use according to claim 15, wherein the solution of calcium hydrogen carbonate is prepared in a direct mode, single batch mode or continuous batch mode.

17. Use according to claim 15 or 16, wherein the solution has a concentration of calcium hydrogen carbonate of from 50 to 1,000 mg/l as $CaCO_3$, preferably from 100 to 800 mg/l as $CaCO_3$, and most preferably from 500 to 700 mg/l as $CaCO_3$.

Claims

1. Multiple batch system for the preparation of a solution of calcium hydrogen carbonate, the multiple batch system comprising
   a) at least one dosing unit,
   b) a master batch line comprising in circular communication
      i) at least one gas dosing inlet,
      ii) at least one mixing unit provided with at least one inlet and at least one outlet, and
      iii) at least one tank provided with at least one inlet and at least one outlet,
   c) at least one slave batch line comprising in circular communication
      i) at least one gas dosing inlet,
      ii) at least one mixing unit provided with at least one inlet and at least one outlet, and
      iii) at least one tank provided with at least one inlet and at least one outlet,

   wherein the master batch line and the at least one slave batch line are independently connected to the at least one dosing unit.

2. Multiple batch system of claim 1, wherein the at least one dosing unit is connected to a water reservoir and a storage container for solid material.

3. Multiple batch system according to claim 1 or 2, wherein the at least one gas dosing inlet of the master batch line and/or the at least one slave batch line is located before the at least one mixing unit.

4. Multiple batch system according to any one of the preceding claims, wherein the master batch line and/or the at least one slave batch line comprises one mixing unit, preferably at least two mixing units, more preferably at least two mixing units connected in series.

5. Multiple batch system according to any one of the preceding claims, wherein the at least one mixing unit of the master batch line and/or the at least one slave batch line is a vertical and/or horizontal mixing unit, preferably a vertical mixing unit.

6. Multiple batch system according to any one of the preceding claims, wherein the at least one mixing unit of the master batch line and/or the at least one slave batch line is at least one static mixer.

7. Multiple batch system according to any one of the preceding claims, wherein the at least one mixing unit of the master batch line and/or the at least one slave batch line is located between the at least one gas dosing inlet and the at least one tank.

8. Multiple batch system according to any one of claims 1 to 5, wherein the at least one mixing unit of the master batch line and/or the at least one slave batch line is at least one dynamic mixer.

9. Multiple batch system according to claim 8, wherein the at least one mixing unit of the master batch line and/or the at least one slave batch line is located between the at least one gas dosing inlet and the at least one tank or integrated in the at least one tank.

10. Multiple batch system according to any one of the preceding claims, wherein the master batch line comprises at least one control unit monitoring the pH, turbidity, conductivity, temperature and/or calcium ion concentration (e.g. by ion sensitive electrode).

11. Multiple batch system according to any one if the preceding claims, wherein the multiple batch system further comprises at least one membrane filtration unit, preferably a cross flow or dead-end membrane microfiltration device and/or a cross flow or dead-end membrane ultrafiltration device.

12. Use of a multiple batch system according to any one of claims 1 to 11 for the remineralization of desalinated or naturally soft water.

13. Use according to claim 12, wherein the desalinated or naturally soft water is selected from distilled water, industrial water, desalinated water, brackish water or brine, treated wastewater or natural water such as ground water, surface water or rainfall.

14. Use of a multiple batch system according to any one of claims 1 to 11 for the continuous preparation of a solution of calcium hydrogen carbonate.

15. Use according to claim 14, wherein the solution of calcium hydrogen carbonate is prepared in a direct mode, single batch mode or continuous batch mode.

16. Use according to claim 14 or 15, wherein the solution has a concentration of calcium hydrogen carbonate of from 50 to 1,000 mg/l as $CaCO_3$, preferably from 100 to 800 mg/l as $CaCO_3$, and most preferably from 500 to 700 mg/l as $CaCO_3$.