Claims

1. A process for the preparation of an aqueous solution comprising at least one earth alkali hydrogen carbonate, comprising the steps of:

   a) providing water;

   b) providing at least one earth alkali carbonate-comprising material;

   c) providing CO_2 or an acid having a pK_a- value < 5;

   d) combining the water of step a) with the at least one earth alkali carbonate- comprising material of step b) and the CO_2 or acid of step c) in any order such as to obtain an aqueous suspension S1 comprising at least one earth alkali hydrogen carbonate;

   e) filtering at least a part of the aqueous suspension S1 obtained in step d) by passing the aqueous suspension S1 through at least one submerged membrane module in order to obtain an aqueous solution S2 comprising at least one earth alkali hydrogen carbonate,

   wherein the at least one submerged membrane module is located in a container.

2. The process according to claim 1, wherein step d) comprises the steps of i1) combining the water of step a) with the CO_2 or acid of step c), and i2) combining the mixture of i1) with the at least one earth alkali carbonate-comprising material of step b); or

   ii1) combining the water of step a) with the at least one earth alkali carbonate-comprising material of step b), and ii2) combining the mixture of ii1) with the CO_2 or acid of step c).

3. The process according to claim 1 or 2, wherein process steps d) and e) carried out in the same container, preferably in a reactor tank.

4. The process according to any one of claims 1 to 3, wherein the at least one submerged membrane module has a pore size preferably < 1 µm, and more preferably < 0.1 µm.

5. The process according to any one of claims 1 to 4, wherein air or process fluid is recirculated across at least a part of the surface of the at least one submerged membrane, preferably from the bottom to top direction of the at least one submerged membrane module and/or container, more preferably CO_2 or acid of step c) is added to the air or process fluid.

6. The process according to claim 5, wherein the container is sealed and the air at the top of the container is used as the feed and reintroduced at the bottom of the container.

7. The process according to any one of claims 1 to 6, wherein the process comprises a further step f) of backwashing the at least one submerged membrane module with water, optionally CO_2 or an acid having a pK_a- value < 5 is added to the water.

8. The process according to any one of claims 1 to 7, wherein the at least one earth alkali carbonate-comprising material of step b) is selected from the group consisting of precipitated calcium carbonate, modified calcium carbonate, ground calcium carbonate and mixtures thereof, preferably the at least one earth alkali carbonate-comprising material in step b) is ground calcium carbonate.

9. The process according to any one of claims 1 to 8, wherein the at least one earth alkali carbonate-comprising material of step b) is ground calcium carbonate being selected from the group consisting of marble, limestone, chalk and mixtures thereof.

10. The process according to any one of claims 1 to 9, wherein the at least one earth alkali carbonate-comprising material of step b) is provided in dry form or in form of an aqueous suspension; and/or

    the at least one earth alkali hydrogen carbonate obtained in step d) comprises calcium hydrogen carbonate and preferably consists of calcium hydrogen carbonate.

11. The process according to any one of claims 1 to 10, wherein the acid provided in step c) has a pK_a-value < 4 and/or the acid is selected from the group consisting of sulfuric acid, hydrochloric acid, nitric acid or citric acid and/or mixtures thereof.

12. The process according to any one of claims 1 to 11, wherein the aqueous solution S2 comprising at least one earth alkali hydrogen carbonate obtained in step e) has an earth alkali concentration as earth alkali hydrogen carbonate in the range from 20 to 1000 mg/l and more preferably from 50 to 600 mg/l and most preferentially from 80 to 400 mg/l; and/or has a pH-value in the range from 6.1 to 8.9 and preferably in the range from 6.5 to 8.5.

13. A process for the mineralization and/or stabilization of water, the process comprises the steps of

    (i) providing water to be mineralised,

(ii) providing an aqueous solution comprising at least one earth alkali hydrogen carbonate as defined in claim 1,

(iii) combining the water to be mineralised of step (i) and the aqueous solution comprising at least one earth alkali hydrogen carbonate of step (ii) in order to obtain mineralised water.

14. The process according to claim 13, comprising a further step (iv) of adding a base, preferably sodium hydroxide or calcium hydroxide, to the mineralised water of step (iii).

15. The process according to any one of claims 1 to 12, wherein the aqueous solution comprising at least one earth alkali hydrogen carbonate obtained is used for the mineralization and/or stabilization of water or as mineralized water.

16. The process according to claim 15, wherein the water is desalinated or naturally soft water.