Claims

1. Installation for the preparation of an aqueous solution comprising at least one earth alkali hydrogen carbonate, the installation comprising

a) a process flow line providing water,

b) at least one dosing unit being suitable for dosing at least one earth alkali carbonate-comprising material into at least a part of the water provided in the process flow line for obtaining an aqueous suspension comprising at least one earth alkali carbonate-comprising material,

c) at least one means being suitable for dosing CO_2 or an acid having a pK_a-value < 5 into at least a part of the water provided in the process flow line or the aqueous suspension comprising at least one earth alkali carbonate-comprising material for obtaining an aqueous suspension S1 comprising at least one earth alkali hydrogen carbonate, and

d) a container being connected to the process flow line by an inlet, wherein the container

i) is configured such that at least one submerged membrane module is located in the container for filtering at least a part of the aqueous suspension S1 by passing the aqueous suspension S1 through the at least one submerged membrane module in order to obtain an aqueous solution S2 comprising at least one earth alkali hydrogen carbonate, and

ii) comprises at least one outlet for releasing the aqueous solution S2 comprising at least one earth alkali hydrogen carbonate from the container,

wherein the container comprises recirculating means which are configured such that air or process fluid is withdrawn from the container via a retentate side of the at least one submerged membrane module and recirculated across at least a part of the surface of the at least one submerged membrane module from the bottom to top direction of the at least one submerged membrane module and/or the container; and

wherein the at least one outlet is connected to a permeate side of the at least one submerged membrane module.

2. The installation according to claim 1, wherein the at least one dosing unit is
   i) connected to a storage container for solid material, and/or
   ii) configured such that the at least one earth alkali carbonate-comprising material is directly dosed into the water provided in the process flow line, or
   iii) connected to a vessel suitable for preparing an aqueous suspension comprising at least one earth alkali carbonate-comprising material, wherein the vessel is connected to the process flow line by an inlet for introducing the water provided in the process flow line and an outlet for releasing the aqueous suspension comprising at least one earth alkali carbonate-comprising material, or
   iv) connected to the container.

3. The installation according to claim 1 or 2, wherein the container is a reactor tank, preferably a sealed reactor tank.

4. The installation according to any one of claims 1 to 3, wherein the at least one means c) is
   i) configured such that the CO_2 or acid having a pK_a-value < 5 is directly dosed into the water provided in the process flow line, or
   ii) connected to a vessel suitable for preparing an aqueous suspension S1 comprising at least one earth alkali hydrogen carbonate, wherein the vessel is connected to the process flow line by an inlet for introducing the water provided in the process flow line and an outlet for releasing the aqueous suspension S1 comprising at least one earth alkali hydrogen carbonate, or
   iii) connected to the container, preferably to the recirculating means suitable for recirculating air or process fluid across at least a part of the surface of the at least one submerged membrane module from the bottom to top

direction of the at least one submerged membrane module and/or the container.

5. The installation according to any one of claims 1 to 4, wherein the at least one submerged membrane module
   a) has a pore size of < 1 µm, and more preferably < 0.1 µm, e.g., from 0.04 to 0.9 µm such as about 0.04 µm or 0.08 µm, and/or
   b) has a flux of ≥ 10 l/(m^2h), preferably in the range from 50 to 150 l/(m^2h), and most preferably in the range from 80 to 150 l/(m^2h), and/or
   c) is of a ceramic, polymer, or other synthetic material.

6. The installation according to any one of claims 1 to 5, wherein the process flow line comprises one or more main process flow line(s).

7. The installation according to claim 6, wherein the process flow line comprises two main process flow lines, preferably a main branch of the main process flow line and a side branch of the main process flow line.

8. The installation according to claim 7, wherein the at least one dosing unit is located in the side branch of the main process flow line.

9. The installation according to claim 7 or 8, wherein the main branch of the main process flow line and the side branch of the main process flow line are configured such that they are merged together upstream of the container.

10. The installation according to any one of claims 1 to 5, wherein the process flow line comprises one main process flow line and one or more side process flow line(s), preferably one main process flow line and one or two side process flow line(s).

11. The installation according to claim 10, wherein the process flow line comprises one main process flow line and two side process flow lines,

preferably a main branch of the side process flow line and a side branch of the side process flow line.

12. The installation according to claim 10 or 11, wherein the at least one dosing unit is located in the side process flow line or, if present, in the side branch of the side process flow line.

13. The installation according to any one of claims 10 to 12, wherein the main branch of the side process flow line and the side branch of the side process flow line are configured such that they are merged together upstream of the container.

14. The installation according to any one of claims 10 to 13, wherein the main process flow line and the side process flow line are configured such that they are merged together downstream of the container.

15. The installation according to any one of claims 1 to 14, wherein the installation comprises base dosing means downstream of the container for introducing a base to the aqueous solution S2 comprising at least one earth alkali hydrogen carbonate.

16. The installation according to any one of claims 6 to 14, wherein the installation comprises base dosing means for introducing a base to the main process flow line downstream of where the side process flow line and main process flow line are merged together, preferably for introducing a base to the mixture of the aqueous solution S2 comprising at least one earth alkali hydrogen carbonate together with the water in the main process flow line.

17. Use of an installation according to any one of claims 1 to 5 for the preparation of an aqueous solution comprising at least one earth alkali hydrogen carbonate.

18. Use of an installation according to any one of claims 1 to 14 for the mineralization and/or stabilization of water.