CLAIMS

1. Hydrogen generator comprising a container (1) for containing an aqueous solution (2) of at least one metal hydride, a reaction chamber (7) containing a catalyst arrangement (22, 24), an exhaust products outlet (32) exiting from the reaction chamber and a gas outlet (34) for extracting the gaseous products and a flow conduit (6) connecting the container with the reaction chamber, characterized in that the reaction chamber (7) is divided into a first (21) and second volume (23), the first volume containing a first, upstream catalyst (22) and the second volume containing a second, downstream catalyst (24), the first volume being smaller than the second volume.

2. The hydrogen generator according to claim 1, characterized in that the second volume (23) comprises a liquid collecting area (35) for collecting an intermediate, partially reacted solution.

3. The hydrogen generator according to claim 2, characterized in that the exhaust product outlet (32) downstream of the second volume (23) of the reaction chamber (7) is connected to an exhaust outlet valve (33) controlled by a control unit (37).

4. The hydrogen generator according to claim 3, characterized in that the liquid collecting area (35) contains a liquid level sensor (36) coupled to the control unit (37) for controlling the exhaust outlet valve (33).

5. The hydrogen generator according to claim 4, characterized in that in an orientation determined reaction chamber (7), the gas outlet (34) is positioned above the liquid level sensor (36).

6. The hydrogen generator according to any of claims 1 to 5, characterized by a pump (5) for pumping the aqueous solution (2) from the container (1) to the first volume (21) of the reaction chamber (7).

7. Hydrogen generator, if desired according to any of claims 1 to 6, comprising a container (1) for containing an aqueous solution (2) of at least one metal hydride, a reaction chamber (7) containing a catalyst arrangement (22, 24), an exhaust products outlet (32) exiting from the reaction chamber and a gas outlet (34) for extracting the gaseous products and a flow conduit (6) connecting the container with the reaction chamber, characterized in that the container (1) for containing the aqueous solution (2), besides a first outlet (3) communication with the flow conduit (6) for liquid output to the reaction chamber (7), comprises a second outlet (12) for gaseous output, the second outlet being connected to a valve (13).

8. The hydrogen generator according to claim 7, characterized in that at least one of the gas outlet (34) of the reaction chamber (7) and the second outlet (12) of the container (1) are connected to a respective fuel cell.

9. The hydrogen generator according to claim 7, characterized in that the second outlet (12) of the container (1) is coupled with the gas outlet (34) of the reaction chamber (7).

10. The hydrogen generator according to claim 7, characterized in that the second outlet (12) of the container (7) opens into the surrounding.

~~11. A method of operating a hydrogen generator comprising a container (1) for containing an aqueous solution (2) of at least one metal hydride, a reaction chamber (7) containing a catalyst arrangement (22, 24), an exhaust products outlet (32) exiting from the reaction chamber and a gas outlet (34) for extracting the gaseous products and a flow conduit (6) connecting the container with the reaction chamber, preferably according to any of claims 1 to 10, characterized in that the aqueous solution (2) of the at least one metal hydride used in the container (1) has a pH value of between 5.5 and 7.~~

~~12. The method according to claim 11, characterized in that the aqueous solution (2) of the at least one metal hydride used in the container (1) has a pH value of between 6.2 and 7.~~

~~13. The method according to claim 11 or 12, of operating a hydrogen generator according to any of claims 1 to 6, characterized in that the ratio of the time of stay of the aqueous solution (2) of the at least one metal hydride in the first volume (21) to the time of stay of the aqueous solution (2) of the at least one metal hydride in the second volume (23) is larger than 1 to 4.~~

~~14. The method according to claim 13, characterized in that the ratio of the time of stay of the aqueous solution (2) of the at least one metal hydride in the first volume (21) to the time of stay of the aqueous solution (2) of the at least one metal hydride in the second volume (23) is larger than 1 to 10.~~

~~15. The method according to claim 14, characterized in that the ratio of the time of stay of the aqueous solution (2) of the at least one metal hydride in the first volume (21) to the time of stay of the aqueous solution (2) of the at least one metal hydride in the second volume (23) is larger than 1 to 30.~~