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METHOD AND GENERATOR FOR HYDROGEN PRODUCTION

ABSTRACT

Methods of generating hydrogen are described, wherein a hydride is hydrolysed in a reaction chamber (10) in an exothermic reaction by the addition of liquid water to be vaporized in the reaction chamber (10), and/or the added water is controlled in relation to the hydrogen generated according to a value x defined by equations, which, for a divalent metal, reads:



wherein M symbolizing the divalent metal and x is preferred in the interval of 1.2 to 1.3. The equation as well as the values of x depend on the sort of hydride, i.e. whether a 1-, 2-, 3- or 4-valent hydride is applied.

Furthermore a hydrogen generator (3) for performing these methods is depicted comprising a reaction chamber (10), optimally in form of a replaceable cartridge and being surrounded by a non-linear thermal insulation, with a water supply inlet (11) and a hydrogen outlet (13), wherein in series with the water supply inlet (11) and/or the hydrogen outlet (13) porous materials (34/35, 41/42) permeable to steam and/or hydrogen but not permeable to hydride and/or liquid water are arranged. The hydrogen generator (3) comprises a water storage vessel (16), also a part of the replaceable cartridge, acting also as condenser for recycled water; and if coupled to a fuel cell (2), the product water of the fuel cell (2) is also supplied. For system balancing, an electric buffer is applied.

Fig. 1