

Title (en)

ELECTROCHEMICAL METHOD FOR PRODUCING PRESSURISED HYDROGEN GAS BY ELECTROLYSIS AND SUBSEQUENT DEPOLARISATION

Title (de)

ELEKTROCHEMISCHES VERFAHREN ZUR ERZEUGUNG VON UNTER DRUCK STEHENDEM WASSERSTOFFGAS DURCH ELEKTROLYSE UND ANSCHLIESSENDE DEPOLARISATION

Title (fr)

PROCEDE ELECTROCHIMIQUE DE PRODUCTION D'HYDROGENE GAZEUX SOUS PRESSION PAR ELECTROLYSE PUIS PAR DEPOLARISATION

Publication

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Application

**EP 19720962 A 20190403**

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Abstract (en)

[origin: WO2019193280A1] The invention relates to an electrochemical method for producing hydrogen gas by electrolysis and subsequent electrochemical conversion of H<sup>+</sup> ions to H<sub>2</sub> ions by depolarisation. Said method is intended to simply and industrially achieve high hydrogen gas pressures, for example >80 bar. To achieve this, the method consists in implementing a step E1 of electrolysis of one electrolyte to produce oxygen gas and a step C° of converting a redox chemical energy to an electrical energy, with H<sub>2</sub> being produced. In said method, - the electrolyte comprises M<sup>m+</sup> ions of a metal M corresponding to the redox couple (M<sup>m+</sup>/M) and A<sup>a+</sup> ions of a depolarisation additive A corresponding to the redox couple (A<sup>a+</sup>/A); - the electrolysis step E1 is initiated by supplying power between the anode and the cathode; A<sup>a+</sup> and M<sup>m+</sup> are respectively deposited as A and M on the cathode during the electrolysis E1 and oxygen gas is released at the anode; - the electrolysis E1 is interrupted by cutting off the power supply between the anode and the cathode; micro-cells are formed between A, M and the H<sup>+</sup> ions, such that a depolarisation corresponding to the conversion step C° occurs, with H<sub>2</sub> being produced and M and A being dissolved into M<sup>m+</sup> and A<sup>a+</sup> at the electrode, which acts as a cathode in step E 1; - the H<sub>2</sub> produced is collected. The invention also relates to devices for implementing such a production method and a kit comprising one of said devices and the electrolyte components.

IPC 8 full level

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