GETTING HYDROGEN FROM WATER

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Abstract

The proposed main technical experimental setup cold gasification and dissociation of liquids with their transfer to the fuel gas through an electric field.
Key words: *gasification of the liquid, dissociation of liquid, high-voltage capillary electro-osmosis, ionization, combustible gas.*

1 INTRODUCTION

1.1. Prospects and problems of hydrogen energy

Effective production of hydrogen from water is an alluring dream of civilization. Because there is a lot of water on the planet, and hydrogen energy promises to mankind "pure" energy from water in unlimited quantities. Moreover, the very process of burning hydrogen in an environment of oxygen, obtained from water, provides an ideal burning and calorific value.

Therefore, the creation and industrial development of a highly efficient technology for the electrolysis of water splitting into H2 and O2 has long been one of the urgent and priority tasks of energy, ecology and transport. Nevertheless, despite the urgency and simplicity of the energy and environmental problems of civilization, they are still effectively not solved. So what are the reasons for high energy costs and low productivity of well-known hydrogen energy technologies?

2 Case Study

1.2. Explanation of problems and electric costs for "hot" evaporation of water with known technologies

In the known methods of splitting water into hydrogen and oxygen, it is necessary to spend a lot of electricity to weaken and completely break the intermolecular and then molecular bonds of water. To reduce energy costs for the electrochemical decomposition of water, additional thermal heating (up to the formation of steam) is often used, as well as the introduction of additional electrolytes. The use of known technologies of thermal evaporation is associated with a huge expenditure of thermal energy. And the use of expensive catalysts in the process of obtaining hydrogen from aqueous solutions is very expensive and inefficient.

1.3. Description of the simplest pilot installation of an electrocapillary pump - a liquid evaporator

In Figure 1 shows the simplest experimental setup of "cold" gasification and dissociation (the process consisting in the decomposition of molecules into several simpler particles - molecules, atoms, radicals, or ions) of liquids with transfer to a fuel gas by means of a single electric field.

The simplest operating device for the experimental realization of the effect of high-voltage capillary electroosmosis for the "cold" evaporation and dissociation of water molecules is shown in Fig. The simplest device (Fig. 1) for implementing the proposed method for producing a combustible gas consists of dielectric capacitance 1, with liquid

2 (ordinary water) poured into it, from a fine-porous capillary material, for example, a fibrous wick 3 immersed in this liquid and pre-wetted therein, from the upper evaporator 4. This device also includes high-voltage electrodes 5, 5-1 electrically connected to a high-voltage controlled source of a sign-static electric field 6 and placed movably above the evaporator 4.

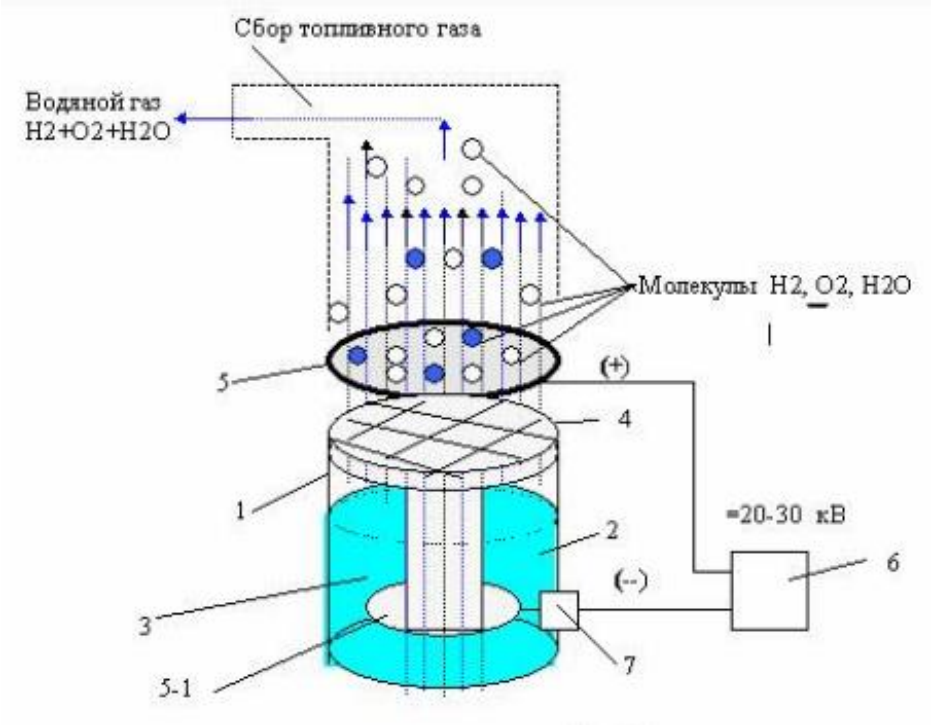

Fig.1. The simplest device of capillary electroosmosis of liquids

1.4. How the device works

As a result, along the capillaries of the wick 3 and the evaporator 4, under the action of the electrostatic forces of the longitudinal electric field, the dipole polarized molecules of the liquid moved from the vessel towards the opposite electric potential of the electrode 5 (electroosmosis), are torn off by these electric field forces from the surface of the evaporator 4 and turn into visible fog i.e. the liquid transforms into another aggregate state with the minimum energy input of the electric field source (6) and the electroosmotic rise of the given fluid begins. In the process of detachment and collision of evaporated liquid molecules with molecules of air and ozone, electrons in the ionization zone between the evaporator 4 and the upper electrode 5 cause partial dissociation with the formation of a combustible gas. Further, this gas flows through the gas collector 7, for example, into the combustion chambers of the motor vehicle.

References

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