

# HYDROGEN GAS PRODUCTION IN DIOSCOREA OPPOSITE FLOUR MEDIA

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## ABSTRACT

Splitting water molecules into hydrogen and oxygen by electrolysis is a commonly used method but the main issue faced is the effectiveness of the production which is still relatively low. Utilization of hydrogen as an environmentally friendly energy source has no doubt, so it is a challenge to be able breaking the water molecules effectively at a relatively low cost in an abundant supply of hydrogen gas.

The efforts to increase the effectiveness of electrolysis can be conducted from various sides, for example by using electrocatalyst and electrolyte or media used. In this research, we have tried to electrolyze water in Dioscorea opposite medium and studied its voltammogram, to know how far the effectiveness of stainless steel and stainless steel/Fe-Co-Ni as electrodes of electrolysis in water of Dioscorea opposite flour. The research method used cyclic voltammetry of the eDAQEChem voltammeter tool, which is able to describe the flow of voltage and current used during electrolysis. Based on the cyclic voltammogram obtained, it can be determined the effectiveness of electrolysis of water, i.e. by determining the optimal conditions of hydrogen production during the electrolysis process.

The activity of stainless steel/Fe-Co-Ni electrode in the production process of hydrogen gas in Dioscorea opposite flour medium turned out to decrease both in terms of product and energy requirement, the condition without media is the optimum condition, while the activity of stainless steel electrode increased in addition of 3 gram of Dioscorea opposite flour per liter of water when observed from the product side, there is an increase in efficiency, to 1.3 times more, with the addition of energy by 23%. The optimum condition of hydrogen gas production is achieved in the addition of 3 grams of Dioscorea opposite flour per liter of water by using stainless steel electrodes and at 0 grams when using stainless steel/Fe-Co-Ni electrode or when observed from energy efficiency. The stainless steel/Fe-Co-Ni electrode is relatively better compared to stainless steel, hydrogen gas product increase of 28% and decrease the energy requirement of 73.26% (addition of 3 gram of Dioscorea opposite flour per liter water); and increased production by 65% (addition of 0 grams of Dioscorea opposite flour per liter of water).

Kata Kunci: *splitting water molecule, voltammogram, Dioscorea opposite, electrolysis effectivity, stainless steel/Fe-Co-Ni electrode*