The Potential of Banana Peel Waste as a Material the Biohydrogen Standard Using the Natural Consortium Technique of Microorganisms.

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ABSTRACT

In supporting the net zero emission target, alternative energy to replace fossil fuels is very necessary considering that the transportation sector contributes 27% of energy sector emissions. One alternative energy that can be used as a substitute for fossil fuels is biohydrogen which only produces water and energy in the combustion process, so it can be called environmentally friendly energy. The process of making hydrogen can be done using several methods, one of them is the fermentation method in a bioreactor which uses microorganisms for the biohydrogen production process. The substrate used in this research was banana peel waste, while the starter used was cow dung and tofu waste. In this research, there are several stages of the production process including literature study, creating experimental designs, preparing tools and materials, pre-treatment, microbial inoculum, preparing substrates, biohydrogen production, and biohydrogen analysis. The Response Surface Method (RSM) method in this research was used to create an experimental design and process the data using Minitab 21. Based on the Response Optimizer curve for the volume of biohydrogen and the Surface Plot curve for the concentration of linear volatile solids, it shows that the optimum conditions for the potential of banana peel waste as a material The biohydrogen standard using the natural consortium technique of microorganisms is at a ratio of 3:1:1 with a pH of 6, while the hydrogen content that has been analyzed in this study is 0%, which may occur because the level testing process is carried out at a fairly long distance from the biohydrogen production process.

Keywords: biohydrogen, consortium, banana peel, microorganisms