

## SUMMARY

**Tria Puspa Sari**, Department of Mechanical Engineering, Faculty of Engineering, University of Brawijaya, April 2016, *The Effect of Electrode Plate Thickness and Catalyst Mass Fraction to Brown's Gas Productivity on Electrolysis Dry Cell*, Academic Supervisor: Denny Widhiyanuriyawan and Haslinda Kusumaningsih.

One of alternative energy that can be developed for future is water, water as hydrogen or brown's gas could produced future fuels by electrolysis wter process. The electrolysis of water is one of any methods to produce hydrogen by converting electrical and thermal energy in to hydrogen and oxygen. In this study, generator of HHO dry cell type is used to produce Brown's gas. Brown's gas consists of two hydrogen and one oxygen or Oxyhydrogen (HHO)

Observation will be conducted to obtained the effect of electrode plate thickness and catalyst mass fraction to increase the productivity of Brown's Gas with mixture of 2500 ml pure water and NaHCO<sub>3</sub> as catalyst. The thickness of plate are 0.3, 1, 1.2, and 1.5 mm. The catalyst mass fraction were observed of 0.69, 1.38, 1.77, and 2.15%. To get the best performance , the catalyst mass fraction were added by 5, 7.5, 10, and 15%.

The results, there were obtained that the optimum production of Brown's Gas occurred at 0.3 mm plate thickness and 2.15% catalyst mass fraction with 0.01690 l/s production rate. The minimum production occurred at 1.5 mm plate thickness and 0.69% catalyst mass fraction with 0.01000 l/s production rate. The best performance of using catalyst occurred at 10% of mass fraction with 0.02250 l/s production rate. The best efficiency is 25.95% at 0.3 mm plate thickness and 2.15% catalyst mass fraction. The optimum efficiency is 36.98% occurred at 10% catalyst mass fraction.

*Keywords* : Brown's Gas, HHO generator, water electrolysis, thickness, catalyst

