

**SINTESIS ELEKTRODA *STAINLESS STEEL/GRAPHENE-POLIANILIN*  
SEBAGAI ELEKTROKATALIS PADA REAKSI  
PRODUKSI HIDROGEN DARI AIR**

RAHMIANI GANI  
12/336604/PPA/03835

**INTISARI**

Penelitian ini bertujuan untuk meningkatkan kinerja *stainless steel* sebagai elektroda kerja sehingga mampu menghasilkan gas hidrogen pada elektrolisis air lebih optimal. Proses pelapisan dilakukan dengan metode voltametri siklik menggunakan *stainless steel* sebagai elektroda kerja, Ag/AgCl sebagai elektroda pembanding, dan Pt sebagai elektroda pembantu. Elektroda hasil sintesis dikarakterisasi dengan voltametri siklik dan SEM-EDS. Selanjutnya, elektroda sintesis digunakan sebagai elektroda kerja pada elektrolisis air dengan penambahan 1 - 5 g/L NaHCO<sub>3</sub>.

Hasil penelitian menunjukkan bahwa elektroda *stainless steel/graphene-polianilin* dapat disintesis dengan menggunakan voltametri siklik. Proses pelapisan dilakukan pada laju penyapuan 10 mV/s, potensial -0,2 – 0,8 V sebanyak 10 siklus. Berdasarkan hasil voltamogram siklik, puncak arus katodik tertinggi diperoleh pada elektroda SS/G-PANi<sub>0,5</sub> pada penambahan 2 g NaHCO<sub>3</sub> sebesar 0,491 mA dan puncak arus anodik tertinggi diperoleh pada elektroda SS/G-PANi<sub>0,5</sub> pada penambahan 2 g NaHCO<sub>3</sub> sebesar 0,191 mA. Berdasarkan rendemen energi, beda potensial adsorpsi H<sup>+</sup> rata-rata terkecil diperoleh pada elektroda SS/G-PANi<sub>0,5</sub> dan beda potensial desorpsi H<sup>+</sup> rata-rata terkecil diperoleh pada SS/PANi<sub>0,5</sub>.

*Kata kunci: stainless steel, elektroda, elektroplating, reaksi elektrolisis, produksi hidrogen, elektrokatalis*

**SYNTHESIS OF STAINLESS STEEL/GRAPHENE-POLYANILINE  
ELECTRODE AS ELECTROCATALYST ON  
HYDROGEN PRODUCTION REACTION FROM WATER**

RAHMIANI GANI  
12/336604/PPA/03835

**ABSTRACT**

The purpose of this study is aims to improve stainless steel as a working electrode to produce more optimal hydrogen gas in water electrolysis. The coating process was performed by cyclic voltammetry method using stainless steel as working electrode, Ag/AgCl as a reference electrode and Pt as counter electrode. Synthezied electrodes was characterized by cyclic voltammetry and SEM-EDS. Furthermore, the synthezied electrode was used as working electrode in electrolysis of water with the addition of 1 - 5 g/L NaHCO<sub>3</sub>.

The results showed that the Stainless Steel/Graphene-Polyaniline electrode can be synthesized using cyclic voltammetry. The coating process was performed at scan rate 10 mV/s, applied potential -0,2 – 0,8 V, for 10 cycles. Based on the cyclic voltammograms result, the highest cathodic peak current of electrolysis obtained by SS/G-PANi<sub>0,5</sub> electrode with 0.491 mA at 2 g NaHCO<sub>3</sub>, while the highest anodic peak current obtained by SS/G-PANi<sub>0,5</sub> electrode with 0.191 mA at 2 g. Based on the overpotential data, the smallest average potential difference of H<sup>+</sup> adsorption obtained by SS/G-PANi<sub>0,5</sub> electrode, while the smallest average potential difference of H<sup>+</sup> desorption obtained by SS/PANi<sub>0,5</sub> electrode.

*Keywords: stainless steel, electrode, electroplating, electrolysis reaction, hydrogen production, electrocatalyst*