

Pengaruh penggunaan membran selektif dalam proses optimasi produk gas klor dengan metode elektrolisis plasma

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Abstrak

[ABSTRAK

Penelitian ini telah berhasil melakukan pengujian produksi gas klor menggunakan membran penukar kation dan membran nafion dengan metode elektrolisis plasma. Pengujian ini meliputi pengukuran pH, konduktivitas, produksi gas klor dan konsumsi energi selama proses reaksi berlangsung. Hasil pengujian menunjukkan penggunaan membran penukar kation meningkatkan kemurnian produk NaOH. Produksi gas klor pada membran penukar kation meningkat 4,3 kali dibandingkan dengan membran nafion dan meningkat 1,3 kali dibandingkan dengan tanpa menggunakan membran. Sementara konsumsi energi per mmol produk menurun 3,1 kali dibandingkan dengan membran nafion dan menurun 1,7 kali dibandingkan dengan tanpa menggunakan membran. Hasil pengujian elektrolisis plasma dengan membran penukar kation menunjukkan terjadi peningkatan produksi gas klor sebesar 33,3 kali dibanding proses elektrolisis dengan membran penukar kation. Sementara konsumsi energi per mmol produk menunjukkan penurunan dari 473,64 kJ/mmol pada proses elektrolisis menjadi 25,85 kJ/mmol pada proses elektrolisis plasma.

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ABSTRACT

This study has successfully tested the production of chlorine gas using a cation-exchange membrane and nafion membrane with plasma electrolysis method. These tests include measurement of pH, conductivity, chlorine gas production and energy consumption during the reaction. The test results showed the use of cation exchange membrane increases NaOH product purity. The production of chlorine gas on the cation exchange membrane increased 4.3 times compared with the nafion membrane and increased 1.3 times compared with no use of membrane. While energy consumption per mmol product decreased 3.1 times compared with the nafion membrane and decreased 1.7 times compared with no use of membranes. The test results of plasma electrolysis with cation exchange membrane showed an increase in the production of chlorine gas by 33.3 times compared with the electrolysis process cation exchange membrane. While energy consumption per mmol of the product showed a decline of 473.64 kJ / mmol in the electrolysis process be 25.85 kJ / mmol on plasma electrolysis process., This study has successfully tested the production of chlorine gas using a cation-exchange membrane and nafion membrane with plasma electrolysis method. These tests include measurement of pH, conductivity, chlorine gas production and energy consumption during the reaction. The test results showed the use of cation exchange membrane increases NaOH product purity. The production of chlorine gas on the cation exchange membrane increased 4.3 times compared with the nafion membrane and increased 1.3 times compared with no use of membrane. While energy consumption per mmol product decreased 3.1 times compared with the nafion membrane and decreased 1.7 times compared with no use of membranes. The test results of plasma electrolysis with cation exchange membrane showed an increase in the production of chlorine gas by 33.3 times compared with the

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