

## ABSTRAK

Pabrik Natrium nitrat ( $\text{NaNO}_3$ ) direncanakan berkapasitas 50.000 ton/tahun dengan menggunakan bahan baku Sodium Klorida ( $\text{NaCl}$ ) dan Asam Nitrat ( $\text{HNO}_3$ ). Lokasi pabrik direncanakan didirikan di Cikarang, Bekasi. Operasi pabrik direncanakan 330 hari, 24 jam sehari. Dalam pembuatan Natrium nitrat ini digunakan proses sintesis dengan kondisi operasi, suhu  $60\text{ }^\circ\text{C}$  dan tekanan 1,5 atm dengan perbandingan mol umpan  $\text{NaCl}$  dan  $\text{HNO}_3 = 1 : 1,3$  waktu reaksi 0,5 jam dan konversi reaksi 90%. Dengan kondisi tersebut dihasilkan produk  $\text{NaNO}_3$  dengan kadar 98%. Umpan awal proses digunakan  $\text{NaCl}$  sebanyak 3628,681 kg/jam dan  $\text{HNO}_3$  sebanyak 6302,47 kg/jam yang dimasukkan di dalam Reaktor Alir Tangki Berpengaduk (RATB). Dari proses ini dihasilkan produk samping  $\text{NOCl}$  dan  $\text{Cl}_2$ . Pabrik Natrium nitrat didirikan di atas tanah seluas  $29.000\text{ m}^2$ , menyerap tenaga kerja sebanyak 100 orang, kebutuhan air 23097,4251 kg/jam, kebutuhan listrik dipenuhi generator listrik 165 KW. Berdasarkan perhitungan ekonomi pabrik  $\text{NaNO}_3$  memerlukan modal dasar sebesar Rp. 219.353.021.655. BEP dicapai sebesar 54,50 % kapasitas produksi, SDP sebesar 23,03 % kapasitas produksi, ROI sebelum pajak 18,80 %, ROI setelah pajak 14,10 %, adapun POT 3,47 thn dan DCFR 15,51 %. Dari uraian diatas, pabrik Natrium nitrat layak didirikan di Indonesia.

**Kata-kata kunci :** Natrium nitrat, natrium klorida, asam nitrat

## ABSTRACT

Sodium nitrate ( $\text{NaNO}_3$ ) plant is planned to have a capacity of 50,000 tons / year using raw materials of Sodium Chloride ( $\text{NaCl}$ ) and Nitric Acid ( $\text{HNO}_3$ ). The location of the plant is planned to be established in Cikarang, Bekasi. The factory operation is planned for 330 days, 24 hours a day. In the manufacture of Sodium nitrate is used synthesis process with operating conditions, temperature  $60\text{ }^\circ\text{C}$  and pressure of 1.5 atm with the mole ratio of  $\text{NaCl}$  and  $\text{HNO}_3 = 1: 1,3$  reaction time 0.5 hours and 90% reaction conversion. With these conditions produced products  $\text{NaNO}_3$  with levels 98%. Initial feeding process used  $\text{NaCl}$  as much as 3628,681 kg / hour and  $\text{HNO}_3$  as much as 6302,47 kg / hr which is included de in Reflected Tank Alir Flow Reactor (RATB). From this process,  $\text{NOCl}$  and  $\text{Cl}_2$  products are produced. Sodium nitrate plant was built on a land area of  $29,000\text{ m}^2$ , absorbing labor as much as 100 people, water requirements 23097.4251 kg / hour, electricity demand is filled with 165 KW electric generator. Based on the economic calculation  $\text{NaNO}_3$  factory requires a capital of Rp. 219.353.021.655. BEP achieved 54.50% of production capacity, SDP of 23.03% production capacity, ROI before tax 18.80%, ROI after tax 14.10%, while POT 3.47 years and DCFR 15.51%. From the description above, a sodium nitrate factory worthy to be established in Indonesia.

**Keywords:** Sodium nitrate, sodium chloride, nitric acid