

ABSTRAK

Pra rancangan pabrik kalsium klorida dari asam klorida dan batuan kapur dengan kapasitas 10.000 ton/tahun direncanakan akan dibangun di Tuban, Jawa Timur. Pabrik ini direncanakan akan beroperasi 24 jam dalam sehari selama 330 hari dalam setahun dengan jumlah pekerja 197 orang.

Bahan baku asam klorida yang diperlukan asam klorida 37% sebanyak 1.733,88 kg/jam dan batu kapur sebanyak 715,88 kg/jam. Proses produksi dilakukan pada suhu 32°C dan tekanan 1 atm di reaktor alir tangki berpengaduk (RATB).

Kebutuhan utilitas air sebanyak 24.620,08 kg/jam, listrik untuk alat proses sebanyak 605,17 kW, bahan bakar boiler berupa *fuel oil* sebanyak 4.330,8913 kg/jam, dan solar sebagai bahan bakar generator untuk sumber listrik cadangan sebanyak 88,6210 kg/jam.

Hasil analisa ekonomi dari pabrik ini menunjukkan jumlah *Fixed capital investment* sebesar Rp 240.268.831.324,- dan *Working capital investment* sebesar Rp 164.291.890.924,-. Keuntungan sebelum pajak sebesar Rp 50.523.957.896/tahun dan keuntungan sebelum pajak (50%) sebesar Rp 50.523.957.896/tahun. *Return On Investment* sebelum pajak sebesar 42,06%, dan ROI setelah pajak sebesar 21,03%. *Pay Out Time* sebelum pajak 2,4 tahun dan POT setelah pajak selama 4,8 tahun. *Break Event Point* (BEP) pada 52,32% dan *Shut Down Point* (SDP) pada 37,58%. Berdasarkan analisa ekonomi tersebut dapat disimpulkan bahwa pabrik kalsium klorida ini layak untuk didirikan.

Kata-kata kunci : Kalsium Klorida, Batu Kapur, Asam Klorida, RATB

ABSTRACT

Preliminary design of calcium chloride plant from hydrochloric acid and limestone with capacity 10.000 ton/years was planned to be built in Tuban, East Java. This chemical plant will be operated for 24 hours a day and 330 day/year with 197 employees.

Raw material needed was hydrochloric acid 37% 1.733,88 kg/hour and limestone 715,88 kg/hour. The production process would be operated at a temperature of 325°C and a pressure of 1 atm in the continous stirred tank reactor (CSTR). Utilities needs include water as much as 24.620,08 kg/hour, electricity for running process tools as much as 605,17 kW, fuel oil as much as 4.330,8913 kg/hour, and 88,6210 kg/hour of solar.

An economic analysis shows that's this chemical plant need to be covered by fix capital investment of about Rp 240.268.831.324,-. Weorking capital investment of about Rp 164.291.890.924,-. The profit before tax is Rp 50.523.957.896,- while the profit after tax was Rp 50.523.957.896 ,- . Percentage of return on investment (ROI) before tax was 42,06% while after tax was 21,03%. Pay out time (POT) before tax was 2,4 years while after tax was 4,8 years. The value of break even point (BEP) and shut down point (SDP) was 52,32% and 37,58%. Respectively based on the economic analisys, it was conclude that plant design of calcium chloride with capacity 10.000 tom/years was visible to build.

Keywords : Calcium Chloride, Hydrochloric Acid, Limestone, CSTR