

## ABSTRACT

### MANUFACTURE OF SODIUM LACTATE FROM MOLASES AND SODIUM HIDROXIDE (NaOH) CAPACITY OF 15.000 TONS/YEAR (Design of Reactor 401 (RE-401))

Written By:  
Sona Erlangga

Design of Sodium lactate plant made from molasses and NaOH is planned to be established in Central Lampung, Lampung. The establishment of the factory is based on consideration of the availability of raw materials, process support units, adequate transportation, easily available labor, and strategic environmental conditions. The plant is planned to produce 15,000 tons of sodium lactate/year, with an operating time of 24 hours/day, for 300 days/year. The raw material used is Molasses as much as 150,000 kg / batch. In the process of making lactic acid through a batch process for 20 hours, the feed is entered in batches, and when the process of making sodium lactate, the lactic acid produced will be flowed in hours. The process of making sodium lactate requires a solution of Sodium hydroxide NaOH, as a mixture in the manufacture of Sodium lactate as much as 1,791.72 kg/hour. The provision of factory utility needs consists of water supply units, steam procurement, air supply, electricity supply units, and sewage treatment units.

The form of the company is a Limited Liability Company (Ltd) using a line and staff company organizational structure with a total of 185 workers.

From economic analysis, it is obtained that :

Fixed Capital Investment	(FCI)	= Rp. 1.315.326.212.240,48
Working Capital Investment	(WCI)	= Rp. 232.116.390.395,38
Total Capital Investment	(TCI)	= Rp. 1.547.442.602.635,86
Break Even Point	(BEP)	= 42,33%
Shut Down Point	(SDP)	= 29,61%
Pay Out Time	(POT) <sup>a</sup>	= 1,88 years
Return on Investment before taxes	(ROI) <sup>b</sup>	= 45,79%
Return on Investment after taxes	(ROI) <sup>a</sup>	= 36,64%
Discounted Cash Flow	(DCF)	= 44,99%

Considering the explanation above, it is appropriate for the establishment of a Sodium lactate plant to be studied further, because it has high profits in the future.

*Keywords: Sodium Lactate, Molasses, NaOH, Design, Feasibility.*

## ABSTRAK

### PRARANCANGAN PABRIK SODIUM LAKTAT DARI MOLASES DAN SODIUM HIDROKSIDA (NaOH) KAPASITAS 15.000 TON/TAHUN (Tugas Khusus Perancangan Reaktor 401 (RE-401))

Oleh:  
Sona Erlangga

Prarancangan Pabrik Sodium Laktat berbahan baku molases dan NaOH direncanakan akan didirikan di Lampung tengah, Lampung. Pendirian pabrik berdasarkan atas pertimbangan ketersediaan bahan baku, unit penunjang proses, transportasi yang memadai, tenaga kerja yang mudah didapatkan, dan kondisi lingkungan yang strategis. Pabrik yang direncanakan memproduksi Sodium laktat sebanyak 15.000 ton/tahun, dengan waktu operasi 24 jam/hari, selama 300 hari/tahun. Bahan baku yang digunakan adalah Molases sebanyak 150.000 kg/batch. Pada proses pembuatan asam laktat melalui proses semi batch selama 20 jam maka umpan yang dimasukkan dalam satuan batch, dan ketika proses pembuatan sodium laktat, asam laktat yang dihasilkan akan dialirkan dalam satuan jam. Proses pembuatan sodium laktat membutuhkan larutan Sodium hidroksida NaOH, sebagai campuran pada pembuatan Sodium laktat sebanyak "1.791,72 kg/jam". Penyediaan kebutuhan utilitas pabrik terdiri dari unit pengadaan air, pengadaan steam, pengadaan udara, unit penyediaan listrik, dan unit pengolahan limbah.

Bentuk perusahaan adalah Perseroan Terbatas (PT) menggunakan struktur organisasi perusahaan line dan staff dengan jumlah karyawan sebanyak 185 orang.

Dari analisis ekonomi diperoleh :

Fixed Capital Investment	(FCI)	= Rp. 1.315.326.212.240,48
Working Capital Investment	(WCI)	= Rp. 232.116.390.395,38
Total Capital Investment	(TCI)	= Rp. 1.547.442.602.635,86
Break Even Point	(BEP)	= 42,33%
Shut Down Point	(SDP)	= 29,61%
Pay Out Time	(POT) <sup>a</sup>	= 1,23 tahun
Return on Investment before taxes	(ROI) <sup>b</sup>	= 45,79%
Return on Investment after taxes	(ROI) <sup>a</sup>	= 36,64%
Discounted Cash Flow	(DCF)	= 44,99%

Mempertimbangkan paparan di atas, sudah selayaknya pendirian pabrik Sodium laktat dikaji lebih lanjut, karena memiliki keuntungan yang tinggi dimasa mendatang.

*Kata kunci : Sodium Laktat, Molases, NaOH, Prarancangan, Kelayakan.*