

ABSTRAK

Kalsium laktat ($(\text{CH}_3\text{CHOHCOOH})_2\text{Ca} \cdot 5\text{H}_2\text{O}$) adalah salah satu bentuk garam yang berasal dari asam laktat yang cukup banyak digunakan di dalam industri kimia, diantaranya sebagai *leavening agents*, *gelling agents*, *coagulant agents*, dan kosmetik. Pembuatan kalsium laktat dengan mereaksikan asam laktat dengan bakteri yang sudah dikulturasi kemudian difermentasikan dalam fermentor *batch* pada kondisi 1 atm dan 50°C selama 96 jam dengan konversi 98%. Pabrik Kalsium Laktat ini tergolong pabrik beresiko rendah karena operasi dan bahan yang digunakan tergolong aman untuk lingkungan. Pabrik Kalsium Laktat direncanakan akan didirikan di Pasuruan, Jawa Timur dengan luas areal lahan ± 4ha dan dibutuhkan 160 tenaga kerja. Pabrik dirancang pada kapasitas 20.000 ton/tahun dan beroperasi secara kontinyu selama 330 hari/tahun untuk menghasilkan kalsium laktat sebanyak 2792,7171 kg/jam, kebutuhan air proses 62.140,2688 kg/jam, listrik 210 Kw/jam, dan total *steam* sebanyak 26.007,5330 kg/jam. Dalam pendirian pabrik diperlukan modal tetap Rp 462.441.142.110,98 dengan keuntungan sebelum pajak Rp 171.067.936.002,58 dan Rp 111.194.158.401,68 setelah dipotong pajak. Dari perhitungan diperoleh *Return on Investment* (ROI) sebelum pajak 36,99% dan 24,05% setelah pajak, *Pay Out Time* (POT) sebelum pajak 2,13 tahun dan 2,94 tahun setelah pajak, *Break Even Point* (BEP) 53,73%, *Shut Down Point* (SDP) 21,29% dan *Discounted Cash Flow of Return* (DCFR) 31,4%. Dengan demikian maka pabrik ini layak untuk dikaji dan dikembangkan lebih lanjut.

Kata-kata Kunci : Kalsium Laktat, Asam Laktat, Fermentasi

ABSTRACT

Calcium Lactate ((CH₃CHOHCOOH)₂Ca . 5H₂O) is one of lactate salt that mostly used in the chemical industries for example as a leavening agents, gelling agents, coagulant agents, and cosmetics. Calcium Lactate is produced by reacting of lactic acid with bacteria which has been cultured, then it fermented in the batch fermentor at 1 atm and 50°C for 96 hours with 98% conversion. This factory is classified as a low risk because the operating plant condition as well as a materials used are safe for the environment. This factory is planned to be constructed in Pasuruan, East Java with total area of ± 4ha of land and required 160 labours. The plant would be designed with the capacity of 20.000 ton/year and operating continuously for 330 days/year to produce 2792,7171 kg/hr. The needed of processing water is 62.140,2688 kg/hr, the needed of electricity is 210 kW, and the needed of total steam is 26.007,5330 kg/hr. This factory has a fixed capital investment about Rp 462.441.142.110,98 with the profit before taxes is Rp 171.067.936.002,58 and the profit after taxes is Rp 111.194.158.401,68. The value of Return on Investment (ROI) before taxes is 36,99% and the after taxes is 24,05%, the value of Pay Out Time (POT) before taxes is about 2,13 years and the after taxes is 2,94%, the value of Break Even Point (BEP) is 53,73% and The Shut Down Point (SDP) is 21,29%, for The Discounted Cash Flow of Return (DCFR) is about 31,4%. Based on analysis above, it can be concluded that Calcium Lactate Plant is quite interesting to study further.

Keywords : Calcium Lactate, Lactic Acid, Fermentation