

INTISARI

Asam oksalat dihidrat memiliki peran cukup penting dalam dunia industri seperti industri pengolahan logam dan industri tekstil. Indonesia merupakan negara pengimpor asam oksalat dihidrat dengan kebutuhan yang relatif meningkat setiap tahunnya. Hal ini disebabkan karena belum adanya pabrik yang memproduksi asam oksalat dihidrat di Indonesia. Berdasarkan latar belakang tersebut, maka dirancanglah pabrik asam oksalat dengan kapasitas 11.000 ton/tahun menggunakan bahan baku glukosa sebanyak 868,19 kg/jam dan asam nitrat sebanyak 1.823,20 kg/jam.

Pabrik direncanakan berdiri pada tahun 2024 berlokasi di Lampung Selatan. Pabrik didirikan untuk memenuhi kebutuhan asam oksalat dihidrat dalam negeri serta untuk ekspor ke luar negeri. Reaksi antara glukosa dan asam nitrat memerlukan katalis V_2O_5 berlangsung pada fase cair-cair, bersifat eksotermis dengan suhu operasi $71^{\circ}C$, tekanan 1 atm dan menggunakan reaktor alir tangki berpengaduk (RATB). Unit utilitas pada pabrik diperlukan untuk menyediakan keperluan seperti air pendingin, air proses, steam, listrik, bahan bakar, udara tekan dan lain-lain. Kebutuhan utilitas meliputi air sebanyak 137.929 kg/jam dan kebutuhan listrik sebesar 115,72 kW. Pabrik ini memerlukan modal tetap Rp10.992.801.489, modal kerja Rp354.516.349.620, dan biaya produksi Rp357.143.248.301.

Berdasarkan evaluasi ekonomi yang dilakukan, pabrik ini tergolong *low risk* dengan nilai *Pay Out Time* (POT) sebelum pajak adalah 2,1 tahun dan POT setelah pajak adalah 2,8 tahun, *Return On Investment* (ROI) sebelum pajak sebesar 39,57% dan ROI setelah pajak sebesar 27,70%, dan *Discounted Cash Flow Rate* (DCFR) sebesar 7,96% pertahun. Berdasarkan analisa ekonomi yang dilakukan, maka dapat disimpulkan bahwa pabrik Asam Oksalat dari Asam Nitrat dan Glukosa dengan kapasitas 11.000 ton per tahun ini menarik dan layak untuk dikaji lebih lanjut.

Kata-kata kunci : asam oksalat dihidrat, glukosa, asam nitrat

ABSTRACT

Oxalic acid dihydrate has a fairly important role in the industrial world such as the metal processing industry and the textile industry. Indonesia is an importer country of oxalic acid dihydrate with relatively increasing needs annually due to the absence of factories producing oxalic acid dihydrate in Indonesia. Based on the background, the oxalic acid dihydrate factory is designed with a capacity of 11,000 tons/year using glucose raw materials as much as 868.19 kg/hour and nitric acid as much as 1,823.20 kg/hour.

The plant will be established in 2024 located in South Lampung to fulfill the needs of domestic oxalic acid dihydrate as well as for export to overseas. The reaction between glucose and nitric acid requires the V_2O_5 catalyst to take place in the liquid-liquid phase, exothermic with operating temperature 71°C , pressure 1 atm, and using continuous stirred tank reactor (CSTR). Utility units on the plant are required to provide purposes such as cooling water, water process, steam, electricity, fuel, air press, and others. Utility needs include water as much as 137,929 kg/hour and electricity needs of 115.72 kW. This plant requires a fixed capital of Rp10,992,801,489, working capital of Rp354,516,349,620, and production cost of Rp357,143,248,301.

Based on the economic evaluation conducted, this factory is relatively low risk with the value of Pay Out Time (POT) before tax is 2.1 years and POT after tax is 2.8 years, Return On Investment (ROI) before tax of 39.57% and ROI after tax amounted to 27.70%, and Discounted Cash Flow Rate (DCFR) amounted to 7.96% per year. Based on the economic analysis done, it can be concluded that the oxalic acid from nitric acid and glucose with a capacity of 11,000 tons per year is economically interesting and worth to be studied further.

Keywords : oxalic acid dehydrate, glucose, nitric acid