

ABSTRAK

Pabrik aseton dirancang dengan kapasitas 30.000 ton/tahun dan bahan baku yang digunakan adalah isopropil alkohol. Aseton banyak digunakan di industri kimia, yaitu pelarut, pembersih kuku, bahan baku industri, penghilang cat. Aseton dibuat dari proses dehidrogenasi isopropil alkohol dengan katalis *zinc oxide* pada kisaran suhu 220°C dengan tekanan 1,97 atm dalam reaktor *fixed bed multitube*. Reaksi berlangsung secara endotermis sehingga diperlukan pemanas. Uraian proses secara umum yaitu bahan baku dipanaskan dalam vaporizer kemudian masuk ke reaktor, Gas keluar reaktor masuk ke separator untuk dipisahkan antara aseton dan hidrogen yang kemudian aseton dimurnikan dalam kolom distilasi, sehingga diperoleh aseton dengan kemurnian 99% berat. Pabrik Aseton berencana didirikan di kawasan Industri Cilegon pada tahun 2027. Pemilihan lokasi pabrik disana karena dekat dengan Pelabuhan Merak Banten sehingga memudahkan transportasi bahan baku dengan memperhitungkan data analisis ekonomi didapat ROI sebelum pajak 71,95%, ROI setelah pajak 43,17%. POT sebelum pajak 1,2 tahun dan setelah pajak 1,9 tahun, dan BEP sebesar 32,74% maka pabrik aseton dengan kapasitas 30.000 ton/tahun dengan proses dehidrogenasi isopropil alkohol layak didirikan.

Kata kunci : Aseton, dehidrogenasi, isopropil alkohol, *zinc oxide*



ABSTRACT

The acetone plant is designed with a capacity of 30,000 tons per year, and the raw material used is isopropyl alcohol. The acetone is widely used in the chemical industry, i.e. solvents, nail cleaners, industrial raw materials, paint removers. It is made from alcohol isopropyl dehydrogenation processes with zinc oxide catalysts at a temperature range of 2200C at a pressure of 1.97 atm in a fixed bed multitube reactor. The reaction occurs endothermically, so a heater is required. The general description of the process is that the raw materials are heated in a vaporizer, then enter the reactor. The gas that exits the reactor goes into a separator to separate acetone and hydrogen, after which the acetone is purified in a distillation column, resulting in acetone with a purity of 99% by weight. The Acetone Factory is planned to be established in the Cilegon Industrial Area in 2027. The selection of the factory location there is due to its proximity to the Merak Port in Banten, which facilitates the transportation of raw materials. Considering the economic analysis data, the ROI before tax is 71.95%, and the ROI after tax is 43.17%. The payback period (POT) before tax is 1.2 years and after tax is 1.9 years, with a break-even point (BEP) of 32,74%. Therefore, the acetone factory with a capacity of 30,000 tons per year using the isopropyl alcohol dehydrogenation process is deemed feasible to establish.

Keywords: Acetone, dehydrogenation, isopropyl alcohol, zinc oxide.