

## INTISARI

Aseton adalah senyawa keton yang paling sederhana. Aseton banyak digunakan pada industri cat, plastik, karet, kosmetik, dan lain-lain. Di Indonesia, kebutuhan aseton dalam negeri dipenuhi dengan impor dari negara lain. Oleh karena itu, pendirian pabrik aseton diharapkan dapat mengurangi ketergantungan pada negara lain dalam pemenuhan kebutuhan aseton.

Proses produksi aseton dari isopropanol dilakukan dengan cara dehidrogenasi isopropanol menggunakan katalis ZnO. Proses dehidrogenasi berjalan pada fase gas pada suhu 350 °C dan tekanan 2,6 atm. Reaksi bersifat endotermis dan berlangsung pada reaktor *fixed bed multitube*. Untuk mempertahankan suhu dalam reaktor digunakan pemanas dari *dowtherm A*. Pada proses pemurnian digunakan absorber dan menara distilasi untuk mendapatkan aseton dengan kemurnian 99,85%.

Pabrik ini akan dibangun di Cilegon, Banten dengan luas area pabrik 3,5 ha dan beroperasi selama 330 hari/tahun dan 24 jam/hari. Kapasitas produksi aseton pabrik ini sebesar 45.000 ton/tahun dengan kemurnian 99,85%. Sehingga diperlukan bahan baku isopropanol sebanyak 5.893,3134 kg/jam. Selain itu dibutuhkan juga air sebanyak 35.713,6065 kg/jam, *dowtherm A* sebanyak 103.755,1697 kg/jam, kebutuhan udara sebanyak 722,4855 kg/jam dan kebutuhan listrik sebesar 158 kWh.

Pabrik ini masuk kategori *low risk*. Pabrik ini membutuhkan *fixed capital* sebesar \$ 44.481.110,68 dan *working capital* sebesar \$ 8.406.490,10. Berdasarkan analisis kelayakan ekonomi pabrik, diperoleh ROI *before tax* sebesar 27,04% dan ROI *after tax* sebesar 13,52%, POT *before tax* sebesar 2,70 tahun dan POT *after tax* sebesar 4,25 tahun, BEP sebesar 45,75%, SDP sebesar 24,41%, dan DCFRR sebesar 19,14%. Berdasarkan nilai-nilai tersebut, dapat disimpulkan bahwa pabrik aseton ini layak dari aspek teknis dan menarik secara ekonomi untuk dibangun.

**Kata kunci :** aseton, isopropanol, dehidrogenasi, endotermis, katalis

## ABSTRACT

*Acetone is the simplest ketone compound. Acetone is widely used in the paint, plastic, rubber, cosmetic, and other industries. In Indonesia, domestic demand for acetone is met by imports from other countries. Therefore, the establishment of an acetone factory is expected to reduce dependence on other countries to meet the demand for acetone.*

*The process of producing acetone from isopropanol is carried out by dehydrogenating isopropanol using a ZnO catalyst. The dehydrogenation process runs in the gas phase at a temperature of 350 °C and a pressure of 2.6 atm. The reaction is endothermic and takes place in a multitube fixed-bed reactor. To maintain the temperature in the reactor, a heater from dowtherm A is used. In the purification process, an absorber and a distillation tower are used to obtain acetone with a purity of 99.85%.*

*This factory will be built in Cilegon, Banten with a factory area of 3.5 ha and operate for 330 days/year and 24 hours/day. The factory's acetone production capacity is 45,000 tons/year with a purity of 99.85%. So that the required raw material isopropanol as much as 5,893.3134 kg/hour. In addition, water is also needed as much as 35,713.6065 kg/hour, dowtherm A is 103,755.1697 kg/hour, air requirement is 722.4855 kg/hour and electricity requirement is 158 kWh.*

*This factory is in the low risk category. This factory requires a fixed capital of \$ 44,481,110.68 and a working capital of \$ 8,406,490.10. Based on the economic feasibility analysis of the factory, ROI before tax was 27.04% and ROI after tax was 13.52%, POT before tax was 2.70 years and POT after tax was 4.25 years, BEP was 45.75%, SDP of 24.41%, and DCFRR of 19.14%. Based on these values, it can be concluded that this acetone plant is technically feasible and economically attractive to build.*

**Keywords :** *acetone, isopropanol, dehydrogenation, endothermic, catalyst*