

## ABSTRAK

### PRARANCANGAN PABRIK SIKLOHEKSANON DARI HIDROGEN DAN FENOL DENGAN KAPASITAS 60.000 TON/TAHUN

#### Perancangan Menara Distilasi (DC-302)

Oleh

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Sikloheksanon merupakan salah satu bahan kimia yang memiliki fungsi sebagai bahan intermediet dalam proses pembuatan asam adipic dan kaprolaktam. Proses produksi sikloheksanon dilakukan dengan menggunakan proses hidrogenasi dengan bahan baku hidrogen dan fenol dengan bantuan katalis Pd/MgO. Pabrik direncanakan dibangun di Kawasan Industri Cilegon, Banten dengan kapasitas produksi 60.000 ton/tahun dengan 330 hari kerja dalam 1 tahun. Penyediaan keutuhan utilitas pabrik berupa pengadaan air, pengadaan *steam*, pengadaan listrik, kebutuhan bahan bakar, dan pengadaan udara. Tenaga kerja yang dibutuhkan sebanyak 175 orang, pabrik berbentuk Perseroan Terbatas (PT) dan struktur organisasi *line and staff*.

Dari analisis ekonomi diperoleh:

|                                          |                    |                            |
|------------------------------------------|--------------------|----------------------------|
| <i>Fixed Capital Investment</i>          | (FCI)              | = Rp 2.710.740.749.639,450 |
| <i>Working Capital Investment</i>        | (WCI)              | = Rp 478.366.014.642,256   |
| <i>Total Capital Investment</i>          | (TCI)              | = Rp 3.189.106.764.281,700 |
| <i>Break Even Point</i>                  | (BEP)              | = 46%                      |
| <i>Shut Down Point</i>                   | (SDP)              | = 30%                      |
| <i>Pay Out Time before taxes</i>         | (POT) <sub>b</sub> | = 1,75 tahun               |
| <i>Pay Out Time after taxes</i>          | (POT) <sub>a</sub> | = 2,09 tahun               |
| <i>Return on Investment before taxes</i> | (ROI) <sub>b</sub> | = 40%                      |
| <i>Return on Investment after taxes</i>  | (ROI) <sub>a</sub> | = 32%                      |
| <i>Discounted cash flow</i>              | (DCF)              | = 39,53%                   |

Berdasarkan paparan di atas, maka pendirian pabrik Sikloheksanon dinilai layak untuk dipertimbangkan kedepannya karena menguntungkan secara ekonomi dan memiliki masa depan yang relatif menjanjikan.

Kata kunci: hidrogenasi, *line and staff*, sikloheksanon, utilitas.

**ABSTRACT**  
**CYCLOHEXANON PLANT PREDESIGN FROM HYDROGEN AND**  
**PHENOL WITH 60,000 TONS/YEAR CAPACITY**

**Design of Distillation Column (DC-302)**

By  
**DYTA EGIA DESTIANA**

Cyclohexanone is one of the chemicals that has a function as an intermediate ingredient in the process of making adipic and caprolactam acids. The production process of cyclohexanone is carried out using a hydrogenation process with hydrogen and phenol raw materials with the help of Pd/MgO catalysts. The factory is planned to be built in the Cilegon Industrial Estate, Banten with a production capacity of 60,000 tons/year with 330 working days in 1 year. The provision of factory utilities is in the form of water procurement, steam procurement, electricity procurement, fuel needs, and air procurement. The workforce is needed as many as 175 people, the factory is in the form of a Limited Liability Company (PT) and the organizational structure of line and staff.

From the economic analysis it is obtained:

|                                          |                    |                            |
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Based on the above explanation, the establishment of the Cyclohexanon factory is considered worthy of consideration in the future because it is economically profitable and has a relatively promising future.

Keywords: hydrogenation, *line and staff*, cyclohexanene, utility