CHAPTER IX
DISCUSSION AND SUMMARY

IX.1. Discussion

Castor oil is the main source of ricinoleic acid because of its high consentration of triglyceride ricinoleate. There is many uses of ricinoleic acid in chemical industies such as raw material for nylon polyester, grease, sinthetic lubricant, paint additives, and many other usage. In Indonesia the needs of castor oil become high these days, it can seen at BPS import data which it can predict the need in 2006 about 2250 tonne.

The process used for splitting ricinoleic acid is hydrolysis process which have advantages that esterification process will not occurs in ricinoleic acid splitting from triglyceride. Other advantages are water is the main splitting agent where water easily get and cheap, the split yield can be high with metal chloride and lipase usage (from 73-90%).

Ricinoleic acid plant will be built at Semarang, Central Java with a few of consideration such as:

1. Near raw material plant i.e. P.T. Kimia Farma.
2. Strategic area because Semarang has many tranportation facilities such as: airport and harbour called Tanjung Emas.
3. Labor force can get easily.

This plant is economically feasible to built based on the calculation in 2 different methods which is Linear methods and Discounted cash flow methods. The calculation discribed that:

1. Rate of Return (ROR) is above present bank interest. It shows that this plant have more advantages than bank investment.
2. Pay Out Time (POT) 2.1 years.
3. Break Even Point (BEP) is 53.89 %.

IX.2. Summary

Preliminary plant design of ricinoleic acid from castor oil with hydrolysis process is feasible to built technically and economic base on the calculation. The analysis data can be seen below:

Preliminary operation:

Process : Fatty acid hydrolysis process

Operation : Semicontinuous 24 hours per day, 330 days per year

Product : Ricinoleic acid 81.6% and 35.02%

Raw material : Castor oil = 1640.6840 kg/day

Utility : Water = 105.6069 m^3/day

Electricity = 200 kVa

Plant location : Semarang, Middle Java

Economic analysis:

Fixed Capital Investment : Rp. 17,091,612,935.12

Working Capital Investment : Rp. 5,959,274,572,792.10

Total Capital Investment : Rp. 5,976,366,185,727.22

Total Product Cost : Rp. 101,246,728,061,581.00

Product selling per year : Rp. 106,825,805,564,775.00

Profit before taxes : Rp. 5,579,077,503,193.98

Profit after taxes : Rp. 3,626,439,127,076.09

Discounted Cash Flow Methods

Rate of Return before taxes : 52.28 %

Rate of Return after taxes : 48.96 %

Rate of Equity before taxes : 78.1 %

Rate of Equity after taxes : 73.24 %

Pay Out Time before taxes : 1.9841 years

Pay Out Time after taxes : 2.1078 years

Break Event Point : 53.89 %

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