

ABSTRACT

The design of the dodecylbenzene plant from dodecene and benzene was made to further study the feasibility of the plant to be established. The reason of this design was planned because increasing index of dedocylbenzene that consumed in Indonesia every year beside that, dedocylbenzene that produced in Indonesia still low that made Indonesia importing much dedocylbenzene every year. This dodecylbenzene plant is designed with capacity 60.000 tons/year and operated in 330 days/year and 24 hours/day continuously. The plant was planned to built in Cilacap, Central Java with total of land area 29.700 m² and employ 162 employees. The raw materials of the process that needed in this plant were 2634.22 kg/hour 99% benzene (w/w) and 5425,071 kg/hour dodecene 95% (w/w). The process used alkylation reaction with hydrogen fluoride (HF) as an active catalyst. The product that formed was dodecylbenzene with purity 99% (w/w). The energy that required to run this factory was 74,4262 Kwh. This energy was partly supplied from generators and PLN. At this plant, water was used during the process on M-02 and as a utility supplied from the Indian Ocean sea as much as 7099,134 kg/hour. From the economic analisys in this plant produced: fixed capital of Rp. 348.704.395.018,5470 and working capital of Rp. 1.578.236.221.360. While the value of production cost was Rp. 1.696.012.781.070. Based on the economic evaluation, the dodecylbenzene plant has ROI before taxes 44,16% while ROI after taxes 22,08%, POT before taxes 1,9 while POT after taxes 3,3, BEP in amount of 41,47%, SDP 28,21%, and DCFR 6,79%. Based on the values above, can be concluded that this factory was economically attractive and deserves further study.

Keywords: Benzene, Dodecene, Dodecylbenzene