

## ABSTRACT

This factory is design to produce adiponitrile from adipic acid and ammonia with capacity of 50.000 tons/years and planned to continue operate 24 hours a day and worked for 330 days a year.

Reaction takes with non adiabatic and non isothermal in catalytic fixed bed multitubular. Catalisator that used is boron phosphate ( $BPO_4$ ). Reactant into reactor at a reactor a temperature at 730 K and 4 atm pressure, while the gases exit reactor at a temperature of 630 K and 3,94 atm pressure. Reaction that occurs is endothermic reaction that requires heating from steam that flowing in the shell.

To produce adiponitrile as much as 50.000 tons/years with 99,5% purity ammonia requires, 99,5% of raw materials as much as 15.787,77 tons/years and purity adipic acid by 67.539,20 tons/years. Utilities requires water as much as 403,82 m<sup>3</sup>/hours, fuel oil 783 kg/hours, and the electricity 530 kVa.

The Factory was planned established in Palembang, south Sumatra province, above the land of 12 Ha, including planned for the expansion. Labor requires are 140 employees. Fixed capital invested about Rp. 151.629.638,389 , and working capital amount Rp. 53.168.834,240.

From economic evaluation found that Return on Investment (ROI) before taxes is 48,856%, Return On Investment after taxes is 39,085%, Pay Out Time (POT) before taxes is 1,462 year, POT after taxes 1,786 year, Break Event Point (BEP) is 55,534% of capacity, Shut Down Point (SDP) is 42,575% capacity and Discount Cash Flow Rate of Return (DCFRR) is 27,435%

Based on the evaluation above, it can be conclude that Adiponitrile plant design from adipic acid and ammonia with capacity 50.000 tons/year proper for considering.