ABSTRACT

Acrylonitrile (ACRY) is a substance for making Synthetic Fiber, Rubber, Plastic which is used for making home tools, office equipments, etc. Acrylonitrile Monomer factory is purpose to fulfill domestic demand even for export. Vinyl Chloride Monomer factory will be built in South Sumatra industry district at Mariana with 60,000 ton/year product capacity and has 166 employees.

Basic material for ACRY product is Ethylene Cyanohidrime (EC). Ethylene Cyanohidrime mechanism reaction need dehydration process in reactor fixed bed non-adiabatic with AL2O3 solid catalyst. The reaction runs on 250 °C with 2 atm pressure. It has about 99% conversion. And then reaction product ACRY process cracking in distillation minaret to make ACRY. The reaction runs on 87.54 °C with 1.1 atm pressure. It has about 80% conversion. The product appeared after reboiler process in distillation minaret than condensed. And then reaction product ACRY process cracking in Stripper minaret to make ACRY. The reaction runs on 104.4°C with 1.2 atm. It's saved as liquid essence.

The factory needs 9,175.5 kw of electricity which is supplied by PLN; and 41,131,462.33 kj/k of fuel.

The factory fixed capital is Rp 294,510,772,013.2, it's from bank loan and capital investment and the factory needs Rp 199,479,508,008 working capital. It has Rp 82,054,146,389 profit in a year before tax and Rp 41,027,073,195 in a year after tax. It's counted that return on investment (ROI) is 28% before tax and 14% after tax; pay out time (POT) is 2.91 year before tax and 4.91 after tax; break even point (BEP) 55.74%; shut down point (SDP) 43.32%; and discounted cash flow rate of return (DCFR) 30%. Based on the economic analysis, it is concluded that plant design of Vinyl Chloride Monomer with capacity 60,000 ton/year is visible to be built.