

ABSTRACT

Methyl mercaptan plant from methanol and hydrogen sulfide takes place in a fixed bed multitube reactor using potassium tungsten as catalyst. The reaction occurred in the gas phase in 422 °C and 7,8 atm. Due to the exothermic reaction, the reactor must be installed with cooling system, with water as coolant.

Because of its capacity that about 42,000 tons per year or 5195,47 kg per hour, it needs total of energy about 76.495.415 kJ per hour, consist of heating needs, steam and operating the plant and overall water requirement is about 75743.679 kg per hour for utility plant, steam and etc. So, for every single ton of methyl mercaptan being produced, it needs 14776675,28 kJ of energy and water requirement approximately about 14631.46 kg.

Methyl mercaptan plant with a capacity of 42,000 tons/year will be established in Balikpapan, East Kalimantan Province, with 155 employees. This plant produces methyl mercaptan with concentration about 95 percent mass.

The fixed capital investment of methyl mercaptan is Rp 26,614,761,767.51 + \$ 10,254,471.57 and working capital about Rp 8,749,007,080.77 + \$ 30,201,190.45, ROI before taxes 47,54%, and 23,77% ROI after tax, while the POT before tax is 1.74 years and 2,96 years after tax. Break-even point is about 49.89%, shut down point is about 37.24% and DCFRR is about 19.7%. In terms of the economy and the need for the establishment of methyl mercaptan plant in Indonesia, the plant with a capacity of 42,000 tons per year is quite exciting to be re-examined to establish in Indonesia.