

ABSTRAK

PRARANCANGAN PABRIK MAGNESIUM SULFAT HEPTAHIDRAT DARI MAGNESIUM OKSIDA DAN ASAM SULFAT KAPASITAS 50.000 TON/TAHUN (Tugas Khusus Perancangan Crystallizer-301 (CR-301))

Oleh :

Guntur Arya Perdana

Magnesium sulfat heptahidrat merupakan salah satu hasil industri kimia yang dibutuhkan baik sebagai bahan tambahan pupuk, bahan untuk obat-obatan, dan bahan *intermediate*. Magnesium sulfat heptahidrat dihasilkan dari reaksi antara magnesium oksida dan asam sulfat. Kebutuhan dalam negeri akan magnesium sulfat heptahidrat diperkirakan akan meningkat sehingga dibutuhkan pabrik yang mampu memenuhi kebutuhan dalam negeri.

Pabrik magnesium sulfat heptahidrat ini direncanakan akan didirikan di Kawasan Industri Cilegon, Jalan Gunung Sugih No. 75, Provinsi Banten. Pabrik ini direncanakan akan menghasilkan magnesium sulfat heptahidrat sebanyak 50.000 ton/tahun, dengan waktu operasi 330 hari/tahun. Bahan baku untuk magnesium oksida diperoleh dari PT. UNIKEMIKA Asia, Bogor dan asam sulfat yang diperoleh dari PT. Insoclay Acidatama Indonesia, Tangerang.

Tahapan proses pabrik magnesium sulfat heptahidrat ini terdiri dari penyiapan bahan baku, tahap reaksi, dan tahap separasi dan pemurnian. Unit utilitas pada pabrik magnesium sulfat heptahidrat terdiri atas unit penyedia air, penyedia listrik, penyedia *steam* dan penyedia bahan bakar.

Bentuk perusahaan adalah Perseroan Terbatas (PT), menggunakan struktur organisasi *line and staff* dengan kebutuhan karyawan 153 orang. Dari hasil evaluasi ekonomi diperoleh :

<i>Fixed Capital Investment</i>	(FCI)	= Rp 311.765.214.641
<i>Working Capital Investment</i>	(WCI)	= Rp 55.017.390.819
<i>Total Capital Investment</i>	(TCI)	= Rp 366.782.605.460
<i>Break Even Point</i>	(BEP)	= 38,5268 %
<i>Shut Down Point</i>	(SDP)	= 28,4046 %
<i>Pay Out Time after taxes</i>	(POT) _a	= 2,21 tahun
<i>Return on Investment after taxes</i>	(ROI) _a	= 32,7451 %
<i>Discounted cash flow</i>	(DCF)	= 35,30 %

Hasil studi kelayakan teknik dan ekonomi menyatakan bahwa pendirian Pabrik Magnesium Sulfat Heptahidrat layak dikaji lebih lanjut.

Kata Kunci : Magnesium sulfat heptahidrat, magnesium oksida, asam sulfat.

ABSTRACT

FEASIBILITY STUDY OF MAGNESIUM SULFATE HEPTAHYDRATE PLANT FROM MAGNESIUM OXIDE AND SULFURIC ACID CAPACITY 50,000 TONS/YEAR (Designing Crystallizer 301 (CR – 301))

By :
Guntur Arya Perdana

Magnesium sulfate heptahydrate is one of the chemical manufacture products that are needed both as fertilizer additives, ingredients for medicines, and intermediate in industry materials. Magnesium sulfate heptahydrate is produced from the reaction between magnesium oxide and sulfuric acid. Domestic demand for magnesium sulfate heptahydrate is expected to increase so that we need factories that can satisfy the demand of the product needs.

The Magnesium Sulfate Heptahydrate Plant is planned to be established in the Cilegon Industrial Area, Gunung Sugih Street No. 75, Banten Province. This factory is planned to produce 50,000 tons of magnesium sulfate heptahydrate, with an operating time of 330 days / year. The raw material for magnesium oxide is obtained from PT. UNIKEMIKA Asia, Bogor and sulfuric acid obtained from PT. Insoclay Acidatama Indonesia, Tangerang.

The stages of the magnesium sulphate heptahydrate manufacturing process consist of preparation of raw materials, reaction stages, and separation & purification stages. The supplies of plant's utility are: water supply units, electricity, steam and fuel. The company entity form is Limited Liability Company (PT), using a line and staff organization structure with the labors of 153 people. Plant's economic evaluation are:

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The results of technical and economic feasibility study is feasible and need further analysis, because the plant is profitable with good sustainability.

Key Word : Magnesium sulfate heptahydrate, magnesium oxide, sulfuric acid.