Nithi Russamee 2009: Simulation and Design of Ammonia Process from Natural Gas Reforming. Master of Engineering (Chemical Engineering), Major Field: Chemical Engineering, Department of Chemical Engineering. Thesis Advisor: Associate Professor Thongchai Srinophakun, Ph.D. 181 pages.

A comprehensive process model is developed for ammonia process from natural gas reforming. The overall process model composes desulfurization, reforming, CO conversion, CO_2 removal, methanation, synthesis and refrigeration. The proposed model addresses reaction kinetic model using external FORTRAN subroutines. The related properties have been calculated by the SRK-BM method. This study coveres heat integration process and process dynamic and control. The model predictive control and process design are preliminary studied.

The results showed that the feed streams of process air, natural gas, process steam and combustion air are 53000, 32000, 102041 and 178220 scmh; respectively. From the proposed process, 3097 kmol/hr liquid ammonia at purity of 99.82 % can be produced. The heat integration process can improve the energy conservation up to 4.5 percent compared to the original one. The controllability analysis can be performed by changing $\pm$ 10 % of feed temperature to observe the dynamic responses. The responses are well acceptance and drive the process to the original steady-state condition.

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