A MATHEMATICAL OPTIMIZATION MODEL FOR CHEMICAL PRODUCTION AT SAUDI-ARABIA FERTILIZER COMPANY

DUFFUAA, SO

King Fahd University of Petroleum & Minerals

http://www.kfupm.edu.sa

Summary

This paper develops a mathematical economic optimization model for chemical production at Saudi Arabian Fertilizer Company (SAFCO) for two of their major products, ammonia and urea.The amount of ammonia and urea produced is determined by the product reactor setting.A reactor setting is determined by a set of operating parameters, such as raw material feed rate, reactor air flow velocity, and pressure.The model selects the minimum cost operating strategy while meeting a given production target.A zero-one integer programming model is developed for each product.The relevant data for the model are obtained, and then the model is solved.The results of the model showed substantial savings per year in both ammonia and urea plants.A systmatic sensitivity analysis is conducted on the optimal solutions of the model.It is concluded that such models should be applied across the petrochemical industry plants in Saudi Arabia.

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