Ammonia Technology, Today and Future

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Abstract
Market of ammonia in the world has been changed because of ammonia low production in Northern America. Start up of some ammonia plants which are now under construction will result in high supply and low price of ammonia. This trend will continue unless the ammonia demand increase.
There are many different methods for natural gas conversion to high value added products such as methanol, ammonia, urea and fertilizer. Scince there are many ammonia plants in Iran, construction of new of ammonia plants is not economically feasible only if these products are being exported.

Keywords: **Ammonia, Natural Gas Conversion, Ammonia Market**

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Design, Construction and Start up of a Helical Baffle Heat Exchanger in Tabriz Petrochemical Company

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Abstract
Nowadays helical baffle heat exchangers are considered as a modern technology which are designed and used to fulfill shortcomings from the common exchanger equipped with segmental baffles. This type of baffles have many advantages, however, a few technical and scientific information have been published for their design in literatures. Implementation of the outcomes of this research at Tabriz petrochemical company reveals that significant improvements can be achieved. The results indicate better performance can be achieved by the helical designed baffles rather than segmental baffles. Also presented correlation based on rapid design algorithm has been modified and reformed. This paper presents thermal analysis of helical baffles in compare with segmental baffles using CFD analysis. The optimum range of baffle's overlaps has been identified within the range 0.4 to 0.6. The outcomes of this project show 50% lower operating costs in compare with a segmental baffle and 3 times higher running operating time without fouling problem.

Keywords: **Helical baffles, Segmental baffles, CFD, Overlap, Rapid Design, Heat Transfer**

Ammonia Plant reformer case study for improvements of furnace conditions to achieve long tube life services

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Abstract
This paper describes the practical adjustments of primary reformer furnace for optimum operating conditions in Khorasan Petrochemical Co to achieve a reformer actual performance for continuity in production and decreasing the maintenance costs. Meanwhile the tubes are designed for high temperature and pressure resistance but the service life of tubes is directly depend on furnace conditions and tube wall temperature. Reformers may have different conditions based on capacity, environmental situations and feed compositions, but in addition to generic solutions each plant should be considered as a case study.

Keywords: **Primary Reformer, Catalyst Tube, Combustion**

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Commercial Catalyst Production in Iran – Challenges and Guidelines

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Abstract
Catalysts, as accelerating agents of chemical conversions, are of great importance in petroleum and petrochemical industries. The catalyst production technology is knowledge-based, highly competitive and secretive and; consequently, in the scientific literature very little information can be found in this field. Despite extensive research efforts on development of catalyst formulations in lab and pilot scales, none of the domestic formulations has been implemented at industrial level. The few practices in catalyst production technology transfer from foreign companies have been unsuccessful due to improper implementation of technology transfer and acquisition, as well as, improper selection of the technology supplier. In this work, the development of commercial catalysts from lab to industry along with the related difficulties in their commercialization is studied and guidelines for their domestic production are provided. Unsuccessful domestic and certain successful foreign experiences for domestic catalyst production, as benchmarks, are also reviewed.

Keywords: **Catalyst, Scale-up, Commercial Production, Technology Transfer, Benchmarking, Petrochemical Industries**

Integration of Petrochemical and Refinery Plants: An Approach to Optimal Utilization of Hydrocarbon Resources

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Abstract

From a global point of view, petrochemical industries were always competitive. Specially, because of fluctuations in products' price and high price of feedstocks, earning money in petrochemicals is always a challenge. In the case that cheap feedstocks are not available, the best method of profitability is integrational optimization in petrochemical complexes and in their adjacent refineries. This fact is valid for installed plants and plants under construction. Petrochemcial-refinery integration is an important factor in reducing costs and increasing efficiencies. Moreover, it guarantees the supply of feedstock for petrochemical industries. Integrated schemes benefits from the economy of scale. On the other hand, an integrated complex can produce more diverse products. "Benchmarking" is the methodology used in this study. Petrochemical-refinery integration avoids selling crude oil, optimizes products, economizes costs and increases benefits. Nowadays, there is an integration approach in various commercial processes of well-known licencing companies.

Keywords: Integration, Petrochemical Complex, Refinery, Production Planning, Economics

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Replacing Commercial Anticorrosion by Amine Solution in Pyrolysis Gasoline Hydrogenation Plant in Arak Petrochemical Company ; pH Control Simulation Based on Electrolyte System

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Abstract

There was a high rate of corrosion in pyrolysis gasoline hydrogenation unit of Arak petrochemical company (PGH), and it was caused some operational problem in this plant. A trademark chemical anticorrosion which is called C39 , was used to inject in the depenthaniser overhead in order to control the corrosion rate. Injection of commercial corrosion inhibitor causes some operational problems, for example fouling in some heat exchangers. Therefore R&D specialists proposed to replace C39 by effective and well-known additive.

At first, the system was simulated by CHEMCAD software in electrolyte system to specify low pH points of the plant. Then , ammonia\monoethanol amine solution was proposed as neutraliser to inject in the plant. After it ,depentaniser and its accessories was simulated in case of injection of this solution.

According to the simulation results , injection of new anticorrosion has no side effect on C5 cut product and operating condition of the column. The corrosion rate will be cotrolled if pH remains at the range of 6.5 to 8. Test run also carried out in the plant by injection of ammonia\monoethanol amine solution at the rate of 0.6 Kg/hr and iron content of the water samples and corrosion test coupon confirmed the simulation results. Now, ammonia\monoethanol amine solution is injected to the plant and corrosion rate has decreased resonably.

Keywords: Corrosion, Pyrolysis Gasoline, Simulation, Corrosion Test Copoun

Evaluation of Unsafe Behaviors in an Iranian Petrochemical company Staffs

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Abstract
The study aims to evaluate the workers' unsafe behaviors in an Iranian petrochemical company. The methodology was based on the safety behavior sampling (SBS) technique. After specifying the unsafe behaviors and with reference to the results of a pilot study, a sample of 3362 was determined, with a sampling accuracy of 5% and confidence level of 95%. The results indicated that 37.7% of workers' behaviors were unsafe. The most important unsafe behaviors were inappropriate use of personal protective with 31% of total unsafe behaviors. The results also notified a significant relationship between education and job experience on unsafe behaviors (P<0.001). The main cause of accident is unsafe behaviors. Considering catastrophic consequences of accidents in petrochemical industry, the results emphasize on diminishing unsafe behaviors and recommend applying behavior-based safety principles.

Keywords: **Safety, Accident, Unsafe act, Petrochemical**