

Butadiene Production

Executive Summary

Project Subject: A new catalyst for one stage butadiene production

Entrepreneur: Dr. R. Talishinsky

Industry: Petrochemistry

Project Status: Pre-seed

Business Description: Butadiene is one of highly demanded products in petrochemical industry. For many years, its production rate has been increasing. The current production of butadiene is about 7,000,000 ton per year in USA, Western Europe and Eastern Asia only, and it does not satisfy the market needs, since yearly increase in demand is predicted to be 3.9%, whereas increase of production rate is 2-3% only. The price of the product during 2000 increased by 25%. Butadiene is produced using n-butane as a raw material in a two stage Gudry vacuum dehydrogenation process. The output of butadiene in this process is usually about 12%. The project presents the extremely effective solution for production butadiene – the catalyst that makes it possible to increase output of butadiene from 12 to 25%.

Product Description: The proposed catalyst can be produced on the usual gamma-oxide aluminum base, but it differs from the existing catalysts by chemical composition and production technology. The catalyst can be manufactured as standard models and can replace the usual ones in existing petrochemical installations. The proposed device has the following advantages:

- Increase of production capacity of the existing installations by approximately 2 times due to higher selectivity of the process and higher output of butadiene (more than 10%)
- The process is performed in one stage and at atmospheric pressure instead of vacuum
- Production of the catalyst is based on widely accessible and non-expensive raw materials
- The proposed device is applicable for dehydrogenation of other paraffins, for example - in production of isoprene, styrene – with the same high efficiency
- The catalyst can be patented

Market Opportunity: The potential market for the technology is very wide. The current number of butadiene production installations comprises more than 70 units, and the demand for devices is constantly growing. The capacity of butadiene production installations in USA and Western Europe varies from 120,000 to 200,000 ton per year. The last year butadiene contract prices were reported to be within \$330-420 per ton. Thus, application of the proposed device will increase a plant's productivity by 10%, which will result in additional yearly product sales of about 5 million USD.

Development: Development of the catalyst is based on results of previous researches conducted by the author of the project. The operation plan will include mainly optimization of the catalyst design and technology of its manufacturing according to specifications of industrial production. It will also include laboratory measurement of catalyst selectivity and testing of experimental batch in a pilot installation.