

## **Phenol Production**

### **Executive Summary**

**Project Subject:** A new technology of phenol production based on solid catalyst

**Entrepreneur:** Dr. Y. Moskowich

**Industry:** Petrochemistry

**Project Status:** Pre-seed

**Business Description:** Phenol is one of most widely used products of petrochemical industry, and the demand for this product is constantly rising. The existing technology of phenol production is based on a two-stage process and has a number of disadvantages, one of which is low selectivity of sulfuric acid as a catalyst and loss of 100–200 kg per each ton of phenol. Small quantities of acid from the reactor penetrate the equipment and cause the corrosion of distillation column and other equipment used. The primary idea of the proposed project is to improve the second stage of the process by applying a new technology based on a solid catalyst.

**Product Description:** The proposed technology implies replacing sulfuric acid with a mild acid catalyst with much higher selectivity. The new catalyst will be used on a solid base, that allows performing the synthesis and catalyst separation using well-known types of equipment. This will result in reduction of byproduct quantity. Excluding of sulfuric acid will also make it possible to avoid the acid corrosion of reactor and separation equipment, to increase reliability of equipment and to use less expensive materials. The main advantages of the technology are as follows:

- Increase of the yield of final products (phenol and acetone) by 5-15%
- Use of less expensive equipment and increase of its reliability due to reduction of corrosion activity of the reaction media

**Market Opportunity:** Potential market for the new technology is extremely wide. In 2001 total world production of phenol comprised approximately 8 mln ton. Among the key-players in the market are such worldwide known companies are Shell Chemical, Mobile, Mitsubishi Chemicals, Enichem and more than 40 other large companies. The total number of phenol production installations is estimated to be about 100, and 3-4 new units are expected to manufacture every year. Production capacity of a unit varies from 16,000 to 200,000 ton per year. In 2001 the price for phenol was about 550-700 USD per ton. Thus, for a medium sized production unit with capacity about 100 kiloton per year, the increase of phenol output by 5% results in additional sales of about 3,000,000 USD.