SINCLAIR REFINING COMPANY

1637 S-3

Reel 26
Bag 2463-8
Frame 800000239-31

(Re: a. Iron catalysts
b. Liquid phase Fischer-Tropsch)

Building License
For Erecting a Pilot Plant
For Reacting CO + H_2 Gas Mixtures

Explanation and Description of the Operation Scheme

This process is a desirable development of the CO + H_2 synthesis; the synthesis takes place in the liquid phase (oil recycling "Eigenoelkreislauf"), and thereby, an optimum solution for the problem connected with controlling the reaction and with removing the excess heat, has been attained. Because of this novel procedure, very robust, fixed, lump-sized fused-iron catalysts can be used, for the CO + H_2 synthesis on a commercial scale; they are like those used for the ammonia synthesis. The results obtained in the unit in question will thus be of decisive importance for the total future development of the Fischer process, perhaps also, for the changing over of actual plants from the previously used cobalt catalysts to the easily available iron catalysts, which can be simply prepared and regenerated. There is an additional advantage to be found in the fact that, thereby, the synthesis will yield a greater variety of useful products. Because of the characteristic features of the heat removal involved, large reaction towers are planned, without any subdivisions into narrow layers; therefore, we may assume that this process will result in the development of large scale synthesis units of a very advantageous construction type. Because of the use of iron catalysts, the products contain many olefins. For this reason, this process is important not only for the fuel production but for the future development of the olefin chemistry. The operation takes place at medium pressure; therefore, it does not compete with the construction of high-pressure units; only small quantities of scarce materials will be needed.

The unit will be operated with flue gases from the tanol plant at Oppau; therefore, no expenditure for gas production will be necessary. The production achieved will be an additive output.

This unit, after being completed, will have a capacity of 5000 tons/year of various products, among them about 2,050 tons/yr of gasoline, 1000 t/yr of fuel oil, about 1,100 t/yr of hard paraffin, 250 t/yr alcohol, 250 t/yr polymer gasoline, and 350 t/yr propylene at continuous operation of the two synthesis units planned. Furthermore, 8,600,000 m^3/t/yr residual gas (3.550 W.E.) and of 16,000 t/yr of steam (reaction heat utilization).

In regard to the working-up of the products, we may add that we intend to make the middle oils (about 700 t/yr, contained in the aforementioned quantity of fuel oil) available for the detergent sector, if need be. By direct sulfonation of the olefins in combination with chlorine dehydrogenation of the paraffin constituent, excellent detergents may be prepared from the middle oils.

The alcohols obtained from the $C_8 - C_{14}$ olefins of the heavy benzene by means of the Oxo-reaction, are important constituents of the cold-resistant lubes.

The Building Project

The plant consists of the synthesis establishment having two units of 9 m^3 reaction volume each; furthermore it has an activated-coal unit, a stabilizer column, and a catalyst regenerator, a pump house and a scaffold for the equipment will furthermore be constructed.

/The text deals with the period forseen for the erection of the new plant (February, 1943 - April, 1944), with the requirement for the construction, the personnel needed, etc./

Operating Data:

1. Energy needed

a. Electric current	3,700,000 kwh/yr
b. Water	2,000,000 m^3/yr
c. Steam	7,000 t/yr
d. Power gas	3,500,000 m^3/yr

2. Raw Material

5,000 m^3/hr (CO + Hg) tension-release gas from the "Wickelofenanlage"

3. Catalysts

For the initial charge 26 m^3
~~For the first two years after operation started, 5 m^3~~
An iron catalyst will be used. It will be prepared by this plant itself.

4. Starting Oil: 60 tons.

(Rest not translated)

MB:op

M. Beth