

FILM STUDY GROUP
REPORT ON MICROFILM REEL NO. 18
Prepared by
THE PURE OIL COMPANY

THE PURE OIL COMPANY
RESEARCH AND DEVELOPMENT LABORATORIES

Report on
Microfilm Reel #18
U. S. Government Technical Oil Mission
Documents from Ammoniakwerke Merseburg, Leuna Werke

Prepared by Hans Schindler

U. S. Government Technical Oil Mission
Microfilm Reel #18

In addition to the reports of which detailed abstracts are attached, the subject microfilm contains the following information which does not seem to be of sufficient general interest to warrant detailed abstracting at the present time. The numbers of the reports are the same as used in the index of the film published by PAW and serve to locate the position of the reports on the microfilm.

Summary Report of Not-Abstracted Information

The following group of reports deals with subjects pertaining to the dehydrogenation of butane, isomerization of butane, and alkylation.

Bag 3042, Item 2 MEMORANDUM ON A DISCUSSION OF ALKYLATION, BUTANE DEHYDROGENATION AND ISOMERIZATION IN LEUNA ON JANUARY 8, 1942
A discussion of the additional fractionating equipment required, as well as guarantee clauses of government contracts.

Bag 3042, Item 3 MEMORANDUM ON A DISCUSSION BETWEEN THE ASTRA ROMANA, FLOESTI, WITH DR. RINGER AND THE CONTRACTING FIRM, UHDE, JANUARY 4, 1942
Equipment details for the alkylation plant to be erected in Ploesti are discussed.

Bag 3042, Item 4 MEMORANDUM ON A DISCUSSION ON THE MANUFACTURE OF DEHYDROGENATION CATALYSTS FOR THE DEHYDROGENATION OF BUTANE, LEUNA, FEBRUARY 19, 1942
Details of the manufacture of catalysts from available raw materials are discussed.

Bag 3042, Item 6 MEMORANDUM ON THE EVALUATION OF BUTANE DEHYDROGENATION CATALYSTS, LEUNA, MAY 18, 1942

The reactors for the evaluation of catalysts are made of quartz and are heated electrically. The reactor used at Oppau has a diameter of 1.2 inches (33 mm.) and is filled with 3.1 or 1.5 cu. inch (60 or 25 cc.) of catalyst. The gas flow is measured by means of gas meters at the inlet and outlet of the catalyst tube. The temperature is measured about 0.4 inches (1 cm.) ahead of the catalyst bed and at the end of the catalyst bed. The temperature gradient in the catalyst bed from the top to the bottom is about 60 - 80°F. (30 - 40°C.). The reactors used at Leuna have a diameter of 0.6 inch (14 mm.) and are filled with 1.5 cu. inches (25 cc.) of catalyst. The feed gas is measured by a standardized orifice meter. The exit gas is not measured. The temperature is measured at 3 points inside the catalyst bed. The temperature within the catalyst bed is constant. The temperature is not increased during the operating period and is only increased when the average conversion falls below 30%. The Oppau reactors have the advantage that they are wider and can, therefore, be filled with the commercially-used catalyst spheres.

Bag 3042, Item 13 LETTER ON THE OCTANE NUMBER OF ALKYLATES, JULY 14, 1942
The following motor method octane numbers are given for alkylates: Alkylate with end point 388°F., 95.5; alkylate with end point 356°F., 95.5; alkylate with 392°F., end-point, 95.

The following group of reports deals with designs and construction details, as well as costs, for various new plants for butane dehydrogenation, isomerization, and alkylation.

Bag 3042, Item 7 MEMORANDUM ON THE CONSTRUCTION WORK AT SCHOLVEN, JUNE 4, 1942

Bag 3042, Item 16 MEMORANDUM ON DESIGN AND CONSTRUCTION WORK FOR THE DEHYDROGENATION, ISOMERIZATION AND ALKYLATION PLANT AT BÖHLEN, JULY 28, 1942

Bag 3042, Item 16a MEMORANDUM ON THE CONSTRUCTION OF AN ALKYLATION PLANT INCLUDING BUTANE DEHYDROGENATION AND ISOMERIZATION AT WESSELING, JULY 21, 1942

Bag 3042, Item 17 MEMORANDUM ON THE CONSTRUCTION OF AN ALKYLATION PLANT WITH AUXILIARY EQUIPMENT AT BLECHHAMMER, JULY 7, 1942

Bag 3042, Item 18 MEMORANDUM ON THE CONSTRUCTION OF AN ALKYLATION PLANT WITH AUXILIARY PLANT AT FÖLITZ, JUNE 29, 1942

Bag 3042, Item 19 MEMORANDUM ON THE CONSTRUCTION OF AN ALKYLATION PLANT WITH AUXILIARY PLANT AT BRÜX, AUGUST 17, 1942

The following reports are concerned with the comparison of the economics of producing butylene by catalytic dehydrogenation and by chlorination, followed by dehydrochlorination. The discussions are mainly of a general nature and are concerned with fitting the process (chlorination) into existing construction plants.

Bag 3042, Item 8 MEMORANDUM ON A MEETING ON MAY 29, 1942

Bag 3042, Item 9 MEMORANDUM ON A MEETING ON MAY 28, 1942

Bag 3042, Item 14 LETTER ON THE DEHYDROGENATION OF PROPANE, JULY 14, 1942
The opinion is expressed briefly without supporting data that for the dehydrogenation of propane the chlorination procedure would be more advisable than catalytic dehydrogenation.

The following reports deal with the exchange of experiences between various alkylation plants, both with respect to production and operating practice.

Bag 3042, Item 21 MEMORANDUM ON A MEETING ON SEPTEMBER 4, 1942

Bag 3042, Item 28 MEMORANDUM ON MEETING ON AUGUST 19 AND 20, 1943

The following group of reports deals with the properties of alkylates.

Bag 3042, Item 21 INSPECTION DATA ON ALKYLATES AND BLENDS OF ALKYLATE WITH HYDROFORMED HYDROGENATION GASOLINE

Bag 3042, Item 23 LETTER ON ANALYTICAL AND ENGINE DATA OF ALKYLATES, OCTOBER 25, 1942

The following group of reports is concerned with operating problems of alkylation units.

Bag 3042, Item 26 MEMORANDUM ON THE UTILIZATION OF ACID SLUDGE FROM THE REGENERATION OF ALKYLATION ACID, JULY 15, 1943

The following possibilities for utilization of the acid sludge have been considered:

1. Neutralization of the acid sludge with dry lime or dry carbide sludge.
2. ~~Manufacture of acid-resistant cement, floor covering, etc., by mixing the neutralized sludge with slag or gravel.~~
3. Use of the acid sludge as such or after neutralization as extender for natural asphalt.
4. Use of the acid sludge as rust-protective coating.
5. Distillation of the neutralized sludge resulted in the production of 48% of a liquid, combustible product, 5% aqueous distillate and 46% pitch.
6. Use of the acid sludge as such as additional fuel for decoy plants.

Bag 3042, Item 31 MEMORANDUM ON THE USE OF PROPYLENE OR PROPANE IN ALKYLATION UNITS, MAY, 1944

The use of propane in the existing alkylation unit would only be possible after extensive changes and some new construction. No statement can be made as to the yield and quality of the product in case that propane is used.

Bag 3042, Item 32 LETTER ON THE USE OF BUTYLENE FROM THE FISCHER-TROPSCH SYNTHESIS IN ALKYLATION, JUNE 15, 1944

The economics for using butane from Fischer-Tropsch plants in the existing alkylation program is discussed.

The following reports are concerned with details of butane dehydrogenation.

Bag 3042, Item 22 MEMORANDUM ON A VISIT TO THE PLANT OF HOESCH, DÜREN, IN CONNECTION WITH WORKING UP SPENT DEHYDROGENATION CATALYST, AUGUST 15, 1942

The possibility of recovering chromium from spent dehydrogenation catalyst is discussed on the basis of the equipment available.

Bag 3042, Item 24 MEMORANDUM ON PLANT TESTS WITH IMPROVED CATALYST DISTRIBUTORS IN THE DEHYDROGENATION REACTOR, LEUNA, FEBRUARY 16, 1943

Bag 3042, Item 27 MEMORANDUM ON THE OPERATION OF A DEHYDROGENATION REACTOR WITHOUT PREHEATER AND THE INSTALLATION OF A PARALLEL FLOW AIR PREHEATER, PÖLITZ, JULY 20, 1943

The advantages of omitting the preheater are simplification of the unit, increased safety, decreased maintenance and operating costs, and decrease of butane losses. No final conclusions on the suitability of the new parallel flow air preheater can be given.

Bag 3042, Item 29 MEMORANDUM ON DEHYDROGENATION OF BUTANE IN A FIXED-BED REACTOR, LEUNA, SEPTEMBER 14, 1943
Operating details are given.

Bag 3042, Item 33 MEMORANDUM ON A DISCUSSION ON ISOMERIZATION, LEUNA, APRIL 24, 1942

A discussion of operating details for a Roumanian alkylation plant.

Bag 3042, Item 40 REMOVAL OF GASEOUS OLEFINS FROM MIXTURES WITH GASEOUS PARAFFINS BY SELECTIVE SOLVENTS, ESPECIALLY THE SEPARATION OF n-BUTYLENE FROM BUTANE MIXTURES, JULY 22, 1939

~~This report is illegible.~~

The following 2 reports are concerned with the construction of underground plants.

Bag 3042, Item 43 LETTER OF OCTOBER 27, 1944
Code letters to be used in correspondence about underground plants are listed.
LETTER OF NOVEMBER 14, 1944
Raw material supply for underground plants.

The following reports deal with the manufacture of miscellaneous chemicals.

Bag 3042, Item 44 LETTER ON THE DEHYDRATION OF DIMETHYL-1,3-DIOXAN TO AMYLENEGLYCOLE, FEBRUARY 8, 1943
LETTER OF FEBRUARY 23, 1943 ON THE SAME SUBJECT

Bag 3042, Item 45 MEMORANDUM ON A VISIT TO LEVERKUSEN, MARCH 2, 1942
The only use for Synol- or Oxo-Alcohols C₇ - C₉ was found to be a leather oil (condensation product of xylene and formaldehyde combined with the subject alcohol). The preparation of a lubricating oil with very low pour point is reported. The oil is prepared by oxidizing a low-viscosity neutral with air and reacting it with 5% isocyanate. The product has no acid or saponification number and has a pour point of -40 to -70°F.

Bag 3042, Item 49 THE USE OF RAMAN SPECTRA IN ANALYSIS, JUNE 12, 1941
GENERAL DISCUSSION OF THE ANALYTICAL USE OF RAMAN SPECTRA

Bag 3042, Item 52 THE PREPARATION OF METHYLAMINE FROM METHANOL AND AMMONIA UNDER PRESSURE IN THE PRESENCE OF A CATALYST, JULY 11, 1932

Bag 3042, Item 58 THE USE OF GENERATOR SLAG FOR THE MANUFACTURE OF SYNTHETIC MONTMORILLONITES FOR THE REGENERATION OF USED OIL, APRIL 4, 1942

The report is illegible.

Bag 3042, Item 56 THEORY OF THE ELECTROLYTIC SYNTHESIS OF SEBACIC ACID FROM ADIPIC ACID, JUNE 26, 1942

Bag 3042, Item 59 REPORT ON THE REMOVAL OF PHENOL FROM PHENOL-CONTAINING WASTE WATER BY MEANS OF FLUE GAS FROM THE BOILER PLANT, FEBRUARY 14, 1934

Bag 3042, Item 63 ONE PAGE ON THE PREPARATION OF ALIPHATIC DIAMINES BY REDUCTION OF NITRILES IN LIQUID PHASE

Bag 3042, Item 70 LETTER NITRATION OF PARAFFINS, JUNE 3, 1943
DISCUSSION OF THE PATENTABILITY OF NITRATING PARAFFINS AT ATMOSPHERIC PRESSURE

The following group of reports deals with catalytic cracking.

Bag 3042, Item 71 MEMORANDUM ON A DISCUSSION ON SEPTEMBER 5, 1944
Discussion of details of the design of a reactor for a pilot plant.

~~MEMORANDUM ON THE DESIGN OF THE CATALYTIC CRACKING PLANT AT MOOSBIRBAUM (CAPACITY: 40,000 TONS PER YEAR). INSPECTION OF C.A.T. CRACKING PILOT PLANT AT LUDWIGSHAFEN. JUNE 12, 1943~~

The fluid-type catalytic cracking pilot unit at Ludwigshafen has been inspected by two Leuna chemists. A small unit with a throughput of 2 - 10 gallons per hour and a larger one for about 23 barrels per day is under construction. The Leuna people mention that they also had been using the fluid-type unit, but they had never been able to obtain sufficient concentration of catalysts in the reaction space and, therefore, never got a satisfactory conversion. The experimental unit seen at Ludwigshafen resembles the one which had been inspected in the U. S. in 1939.