

FILM STUDY GROUP
SUBJECT INDEX AND REPORT

T. O. M. REEL NO. 68

Prepared by

GULF RESEARCH AND DEVELOPMENT CO.

GULF RESEARCH & DEVELOPMENT COMPANY

Pittsburgh, Pennsylvania

ABSTRACT AND INDEX OF TECHNICAL OIL MISSION

MICROFILM

REEL NO. 68

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SCANNING OF REEL #68

U. S. GOVERNMENT TECHNICAL OIL MISSION

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BAG 3445 TARGET 30/5.01

RUHRCHEMIE A.G. STERKRADE-HOLTEN

Frame No.

ITEM 97: Oven 11, Filling 14 Continued from Reel 67
(Completed)

1

Data sheets for the 14th filling of Oven 11, pressure experimental plant using an iron catalyst (?) at 9 atm. and about 220°C.

- a) Percentages of benzine, oil and paraffin, specific weight, boiling ranges and olefin content.
- b) Production reports giving gas analyses and amounts of rest gas, synthesis gas, water gas and recycle gas used, conversion and liquefaction figures, yields of products.

ITEM 98: Physical Properties of Waxes (Graphical)

278

This is a collection of graphs of the physical properties of waxes showing the boiling point as abscissa and the solidifying point as ordinate. The number of carbon atoms is also plotted against the boiling point. Various paraffin qualities were investigated.

ITEM 99: Analysis of Various Waxes (Graphical)

287

This is a collection of graphs showing the analysis of various waxes. Curves are given for boiling point vs. weight per cent and solidifying point vs. boiling point.

ITEM 100: Properties of Various Cracked Spirits (Graphical)

291

This is a collection of graphs for various cracked gasolines showing boiling point vs. specific gravity, boiling point vs. olefin content, boiling point vs. aniline point, boiling point vs. iodine number, lead susceptibility (ccm. tetraethyl lead/lt.) vs. octane number and boiling point vs. index of refraction.

ITEM 101: Octane Nos., Etc., of Various Primary Products (Graphical)

298

This is a collection of graphs of boiling point vs. octane number of various gasolines (original primary product, original hydrogenated, "bleicherde" refined, and hydrogenated refined) and susceptibility to tetraethyl lead and iron pentacarbonyl (cc vs. octane number). Viscosity,

viscosity pole height, evaporation and flash point of mixtures of two oils are shown as a function of percent. Differences between research and motor method octane number for activated carbon gasoline and cracked gasoline in mixture with BV benzene. Variation of the gasoline content of the total product with its octane number for pressure synthesis, recycle-high temperature synthesis with synthesis gas and with water gas. Variation of octane number of untreated primary and cracked gasolines with the olefin content at constant boiling number, variation of the octane number with the primary gasoline content of the total product from water gas by simple passage over normal catalyst; the same with water gas recycling. Variation of the octane number with the boiling number for normal pressure synthesis. Comparison of the olefin contents of 20° cuts for different primary gasolines.

ITEM 102: Wax Yields from Certain M.P. Experiments 318

These are tables and graphs. Tables show the conditions of operation and the yields for four ovens. The graphs are boiling point vs. weight per cent and boiling point vs. solidifying point.

ITEM 103: Apparatus for Vapor Lock Test 322

This is an extensive description with an illustration of the apparatus used in making vapor lock tests.

ITEM 104: Iodine No. - Micro Method 331

This is a description of the micro determination of iodine number in gasolines and Diesel oils including a sketch (illegible).

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RUHRCHEMIE A.G. STERKRADE-HOLTEN

ITEM 93: Works Conferences 1937-1942 336

These are minutes of Ruhrchemie conferences with regard to production programs, the persons allowed to enter the plant without appointment and special operational questions such as paraffin plant, pressure plant, Ovens I, II, III, V, water gas plant, purification, hydrogen plant, emptying of ovens.

ITEM 94: Fortnightly Data 1943-1944 373

These are long tables for 10-day periods giving quantities of raw materials and yields.

ITEM 95: De-alcoholization of Alcohol-Hydrocarbon Mixtures 386

This is a handwritten report concerning the removal of OXC alcohols from Diesel oils by soap solutions. The method works well at room temperature and higher. The amount of removal depends on the amount of soap.

solution used; stratification is better when working at 70°C. than at room temperature. Many tables and graphs are given and the apparatus for continuous alcoholic extraction is shown.

Report on removing hydroxylated compounds from cobalt recycle product and from iron Diesel oils using soap solutions. The experiment is precisely described.

A draft for a patent application for the process (the soap concentration is between 5 and 25 per cent, the pH between 7.0 and 9.5). Three examples and four claims are given.

ITEM 96: Properties of C₁₀ and C₁₁ Hydrocarbon Fractions
as Used for the OXO Process

427

This is a collection of graphs and tables. Properties of the C₁₀ and C₁₁ hydrocarbons from a cobalt recycling operation, a graph on octane number vs. methyl substituted paraffinic hydrocarbons, a table on density, boiling point and refractivity for 27 decanes, aniline points of the C₁₁ paraffins, solidifying curves of C₁₁ hydrocarbons from different sources, distillation curves for a C₁₁ cut from medium pressure synthesis, densities of cracked oil and of cobalt recycle product C₁₁, distillation curve of cracked oil C₁₁ not hydrogenated, densities of C₁₁ cracked oil and cobalt recycle fraction, graphic interpretation of alcohol yield in the OXO synthesis of C₁₂ alcohol from C₁₁ branched chain cracked olefins (the yield was 29.5 per cent) and a handwritten description and data on alcohols obtained in the OXO synthesis.

ITEM 97: Detailed Summaries of Synthesis Data - January-June, 1944

487

This is a report giving in table and graphical form the calculated and measured yields in the pressure and normal synthesis for 10-day periods in an attempt to determine cobalt losses in the synthesis.

ITEM 98: Synthesis Researches (Hanisch) 1943

512

These are tables from the catalyst production plant. The tables give some data on the method of preparation and reduction of the catalysts and their activity in test runs at 10 atm. and about 200 to 210°C. The following catalysts are reported:

100 Fe, 5 Cu, 10 CaO, 30 Kieselguhr

100 Fe, 5 Cu, 10 ZnO, 5 Kieselguhr

ITEM 99: Separation of Isomeric Fatty Acids

599

Patent application for the separation of isomeric fatty acids which are obtained by self-condensation of crotonic aldehyde amines (secondary) in the presence of excess acid and of alcohol solvents followed by catalytic reduction of the polyenealdehydes formed and heating of the saturate alcohols obtained with alkalies.

This acid mixture is not suitable for production of soap. It was found that separation is possible if the acids are converted into salts of polyvalent metals of groups II, IIIB or IVB of the periodic table and extracting this salt mixture with low molecular weight alcohols, ethers, ketones or esters. The salts of the fatty acids which are unsaturated contain oxy or alkoxy groups and are easily soluble in the solvents mentioned; this gives a method of obtaining the saturated high molecular weight fatty acids. Calcium, barium, strontium, magnesium, aluminum, zinc and lead were used advantageously. Two examples are given.

Another patent application describes different methods which utilize the fact that on saponification of fatty acid mixtures the straight chain acids will saponify preferentially and separation therefore can be carried out by partial saponification of the mixture. With this method it is necessary to have fatty acid mixtures of uniform molecular weight which may be obtained by prefractionation of the mixture. Two examples, two claims and several flow sheets are given.

A report is included which discusses the separation of fatty acid mixtures and explains their reaction by differences in solubility and thereby differences in distribution coefficient between a soap solution and benzene. Separation should be possible if a ratio other than 50 per cent saponification is used.

ITEM 100: Removal of Inorganic Material from Crude OXO Aldehydes

614

Examples are given for treating crude aldehydes of different molecular weight for purification. The compounds used for purification are sulphuric acid (5 per cent), nitric acid (5 per cent), acetic acid (25 per cent), potassium sulphate solution, saturated ammonium sulphate solution and saturated secondary sodium phosphate solution. The aldehydes become almost colorless through removal of catalyst residues.

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ITEM 133: Specimen Monthly Reports from the Catalyst Factory

618

These are four monthly reports from the catalyst plant of Oct. 26, 1942; Nov. 20, 1941; Nov. 22, 1940 and Nov. 25, 1939. The reports describe the production of catalyst, amount of old catalyst received and new catalyst delivered, extraction and reduction of the catalyst and regeneration of cobalt and thorium oxide. The reports do not appear to describe any items of special interest.

A collection of tables on catalyst testing is shown which give data for 100 Fe:5 Cu catalysts and some cobalt catalysts. The tables contain data such as temperature, pressure, contraction, throughput, CO conversion, CO degree of liquefaction, etc., yields, boiling range of products obtained, olefins, etc.

ITEM 134: Iron Catalyst Synthesis Results 500-593

837

These are extensive tables concerning costs for the production of iron catalysts. Steam and electrical current consumptions are reported.

A report of Nov. 24, 1938, on the operation of the catalyst plant is also included under this item (similar to reports in Item 133).

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ITEM 105: Production Data for the Licensees 1938-1943

846

This is a collection of tables showing the production of licensees, mostly Ruhrchemie, giving the monthly average figures for the gas used (H_2/CO), contraction, etc., oven performance, number of ovens, hours of reaction, space velocities and oven temperatures.

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ITEM 48: Monthly Reports June to September, 1944 (Plants and Labs.)

892

These are monthly reports from June, 1944, to September, 1944, concerning the plants and laboratories of Ruhrchemie and the catalyst plant. The reports cover a great variety of subjects but are usually only exceedingly short, presupposing knowledge of what is going on in the plants and laboratories and therefore give hardly any insight to the subject matter. The subjects included are water gas plant, synthesis plant, paraffin plant, lubricating oil plant, regeneration of catalysts, dehydrogenation, polymerization, catalytic cracking, production of sulphonates, aromatization, nitroparaffins, paraffin oxidation, lubricating oil from soft paraffin through chlorination and dechlorination, distillation of paraffins, purification of gases, kieselguhr investigations, preparation of esters of low pour point, methanization, preparation of propyl amine from propyl alcohol and ammonia (isopropyl alcohol does not work), preparation of greases and soaps, sulphonation of olefinic products, preparation of nitrotoluol with 47 per cent nitric acid, gasoline and Diesel oil investigations (CO_2 was used in Diesel oil tank to decrease the danger of explosions but it was found that the neutralization number increased very much and therefore corrosion might occur), production of 2,2-dimethyl butanol-3 (isohexyl alcohol), etc.

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ITEM 1: Drawings of the OXO Plant

988

Illustrative drawings of the OXO plants.

E N D O F R E E L