

FILM STUDY GROUP

SUBJECT INDEX AND REPORT

T.O.M. REEL NO. 81

Prepared by

STANDARD OIL DEVELOPMENT COMPANY

STANDARD OIL DEVELOPMENT COMPANY

ABSTRACT AND INDEX OF TECHNICAL OIL MISSION

MICROFILM

REEL NO. 81

INDEX FOR REEL 81

| <u>Subject</u> | <u>Item No.</u> | <u>Pages</u> |
|---|-----------------|------------------------|
| I. <u>Analytical Methods</u> | | |
| a) Glass Apparatus for determination of decomposition of antimony chloride | 150 | 4034-4039 |
| b) Measurement of Spot Temperature under conditions where Steep Gradients exist | 150 | 4040-4043 |
| II. <u>Chlorination of Paraffins</u> | 163 | 4694-4702 |
| III. <u>Catalytic Oxidation</u> | | |
| Oxidation of aromatics & naphthas | 180 | 4845-4847 |
| IV. <u>Dewaxing of Lube Oils</u> | | |
| Dutch-Shell report on factors which control dewaxing | 177 | 4831-4837 |
| V. <u>Extraction of Lube Oils</u> | | |
| Loss of $SbCl_3$ during extraction | 161 | 4684-4692 |
| VI. <u>Monthly & Bi-monthly Progress Reports</u> | | |
| Dutch-Shell for Jan.-Feb., 1944 | 151 | 4051-4131 |
| Dutch-Shell for Dec.-April, 1943 | 152-159 | 4133-4682 |
| VII. <u>Paraffin Wax Emulsions</u> | | |
| " " " | 162 | 4693 |
| " " " | 166 | 4711-4716 |
| VIII. <u>Patent Matters & Reports</u> | | |
| Dutch-Shell list of subjects investigated for patentability Jan. 1941-April, 1943 | 171 | 4757-4763 |
| Dutch-Shell list of patent memoranda from Jan.1941-April,1943 | 172 | 4764-4766 |
| List of reports of work done by Dutch-Shell in 1943 | 173 | 4769-4772 4775-4776 |
| Foreign & Dutch-Shell Patents applied for and assigned to Dutch-Shell | 173 | 4781-4782 |
| Abstracts of patent applications by Dutch-Shell in Amsterdam in 1943. | 173 | 4783-4786 |

| <u>Subject</u> | <u>Item No.</u> | <u>Pages</u> |
|--|-----------------|-----------------|
| IX. <u>Patent Applications</u> | | |
| a) Chemical Oxidation of Organic eps. with catalyst | 181 | 4854-4859 |
| b) Preparation of solid emulsifiable oil | 187 | 4885-4887 |
| c) Preparation of extreme Pressure Lubricants | 188 | 4888-4890 |
| d) Preparation of Extreme Pressure Lubricants | 191 | 4897-4900 |
| e) Preparation of Extreme Pressure Lubricants | 192 | 4901-4902 |
| f) Preparation of Extreme Pressure Lubricants | 193 | 4904-4905 |
| g) Preparation of Sludge Dispersing Aids | 189 | 4891-4893 |
| h) Separation of Paraffins from Isoparaffins | 190 | 4894-4896 |
| i) Synthetic Polymer Oils | 194 | 4906-4907 |
| j) " " " | 195 | 4908-4911 |
| k) " " " | 196 | 4912-4915 |
| l) " " " | 197 | 4916-4918 |
| m) Clay Pretreatment of Olefins for Preparation of Polymer Oils | 198 | 4919-4920 |
| n) Filler for Rubber & Plastics | 201 | 4926-4927 |
| o) " " " " | 203 | 4930-4933 |
| p) " " " " | 204 | 4934-4938 |
| q) " " " " | 206 | 4942-4947 |
| r) " " " " | 207 | 4948-4952 |
| s) Preparation of Synthetic Rubber | 202 | 4928-4929 |
| X. <u>Synthetic Lube Oils</u> | | |
| Flow Sheets | 217 | 4954 |
| XI. <u>Wax Plant</u> | | |
| Flow Sheet | 216 | 4956 |
| XII. <u>Propane Peroxide</u> | | |
| Flow sheets on Process | 160 | 4683 |
| Description of Process & Data | 169 | 4740-4752 |
| Review of work on Process for 1940-1941 | 175-176 | 4807-4830 |
| Report on Dutch on preparation of Sodium Perborate & Similar Compounds from Propane Peroxide | 178-179 | 4838-4839 |
| Preparation of hydrogen peroxide from propane peroxide | 180(a) | 4848-4851 |

Pages 4034-4039 - Item 150

Section II F-2

Glass apparatus for the determination of the decomposition of antimony trichloride.

Pages 4040-4043

Section II F-3

Measurements of spot temperatures under conditions where steep gradients exist.

Pages 4051-4131 - Item 151

Dutch-Shell, January-February, 1944 bimonthly progress report. The index of the topics covered in this report is given on pages 4127-4131. Inasmuch as the subject matter covered in this report is essentially the same as that given under Item 150 which bears a later date, no attempt has been made to review this section.

Pages 4133-4682 - Items 152-159

These items cover Dutch-Shell monthly and bi-monthly progress reports dating back from December, 1943 to April, 1943 and cover practically the same subject matter as those listed under Items 150 and 151. No attempt has been made to review this material since it is assumed that those who receive this information will want to go over any items of interest from month to month in order to obtain a complete story.

Page 4683 in 6 sections - Item 160

Four flow sheets on installation for the manufacture of propane peroxide.

Pages 4684-4692 - Item 161

~~Dutch-Shell 1944 report in German on losses of antimony trichloride when used for extraction of lube oils.~~

Page 4693 - Item 162

Memorandum on the preparation of paraffin wax emulsions using sulfite liquids as the emulsifiers. The emulsion is used for sizing paper.

Pages 4694-4702 - Item 163

Dutch-Shell report in German on the chlorination of paraffins. Though the purpose of the Shell work was to prepare a glue for caterpillars, the report is of interest in connection with the manufacture of chlorinated paraffins. The authors give as conclusions of their work the following:

1. Chlorine gas is the best chlorinating medium.
2. Solvents are not required to obtain highly chlorinated solid products, but solvents are helpful to permit chlorination of the dissolved paraffin when the viscosity of the reaction mixtures is too high.
3. The available literature does not clarify the effect of the temperature and catalyst on the chlorination process.
4. The feed material as well as the reaction conditions influence the property of the end products and they have to be controlled in order to obtain a product of constant composition.

Pages 4711-4716 - Item 165

Dutch-Shell report in German on the preparation of wax emulsions for use in the paper industry. The methods described include:

1. Use of clay constituents.
2. Use of egg albumin.
3. Use of sulfate liquids.
4. Use of chemical methods.

In this paper there appears to be information only on topics 1 and 3.

Page 4717 - Item 167

A table listing the distribution of personnel in the Dutch-Shell Amsterdam Laboratory in January, 1944.

Pages 4740-4752 - Item 169

1940 Dutch-Shell report in German on the manufacture of propane peroxide. Most of this report deals with the optimum conditions for the oxidation of propane to produce propane peroxide in laboratory and pilot plant operations. Studies were also conducted on methane, ethane, normal butane, and isobutane but only propane gave significant yields of propane peroxide. There is information on the preparation of H_2O_2 and sodium perborate from propane peroxide. For semi-technical operation the following conditions and yields are given for propane peroxide production:

Pages 4740-4752 - Item 169 - cont'd

| | |
|--|---|
| Gas circulation in the reaction vessel in coolage | around 65 m ³ /Hr. |
| Propane rate | 20-25 M ³ /Hr. |
| Oxygen " | 5/10 M ³ /Hr. |
| Propane plus propylene plus CO, etc. | about 25 M ³ /Hr. |
| propane peroxide production | 8-10 Kg./Hr. |
| Total active oxygen content | 1 Kg. 30% H ₂ O ₂ |
| Content of free H ₂ O ₂ | about 5 Kg. 30% H ₂ O |

It is also reported that out of 100 gms. of propane oxidized at 470°C. at 4 secs. contact time, there is obtained about 35 gms. H₂O₂, about 13 gms. acetaldehyde, about 9 gms. of polymerized formaldehyde, and about 50 gms. of formic acid-acetic acid in the ratio of 70:30. Page 4752 gives analytical methods in connection with this process.

Pages 4757-4763 - Item 171

Dutch-Shell list of subjects investigated for patentability from January 1941-April, 1943.

Pages 4764-4766 - Item 172

Dutch-Shell list of patent memoranda submitted from their main office from January, 1941 to April, 1943. Among this list are (a) patent memoranda on treatment of propylene with steam to produce acetone directly, (b) copolymerization of isobutylene with vinyl chloride or vinylidene chloride.

Pages 4769-4772 & 4775-4776 - Item 173

List of reports of work done in 1943 by Dutch-Shell. This list might be useful as a guide to the fields of work engaged in by Dutch-Shell.

Pages 4781-4782 - Item 173

Foreign and Dutch-Shell patents applied for and assigned to Dutch-Shell Development Company.

Pages 4783-4786 - Item 173

Abstracts of patent applications by Dutch-Shell in Amsterdam in 1943. There are several patent applications which deal with the preparation of fibers from butadiene polymers reacted with SO₂.

Pages 4807-4830 - Items 175-176

Dutch-Shell report in German on review of work for the period 1940 to May, 1941, on oxidation of hydrocarbons to produce peroxides. This information is the background to subsequent reports which appear in other reels.

Pages 4831-4837 - Item 177

Dutch-Shell report in German on investigation of factors which control dewaxing of lube oils.

Pages 4838-4844 - Items 178-179

Dutch-Shell reports written in Dutch on the preparation of sodium perborate and similar compounds from propane peroxide. These reports are merely given as reference.

Pages 4845-4847 - Item 180

Dutch-Shell report in German on a summary of their work in the field of catalytic oxidation. It includes data on the oxidation of ortho and para xylene. In the case of ortho xylene, a yield of 70% phthalic anhydride by air oxidation in the presence of vanadium oxide catalyst is reported, whereas p-xylene gave a yield of only 25-50%. Modification of the catalyst by using pumice as the support gave only a slight increase in yield. Some information is given on the preparation of adipic acid from cyclohexane. It is also stated in this report that olefins can be oxidized to glycol using osmium tetroxide as a catalyst but it is not economical. The suggestion is made that pentenes might be oxidized to glycols by hydrogen peroxide.

Pages 4848-4851 - Item 180(a)

1944 memo reports dealing with preparation of hydrogen peroxide from propane peroxide.

Pages 4854-4859 - Item 181

Dutch-Shell Patent Application No. 96,717.

Chemical oxidation of organic compounds with peroxides in the presence of a catalyst. An example is given on the oxidation of allyl chloride with peroxide in the presence of osmium tetroxide to give propylene chlorhydrin.

Pages 4885-4887 (R109211 IV/a/23c) - Item 187

German Patent Application

Preparation of emulsifiable oils in solid form in which the novelty claimed is the addition of hydrogenated aromatics, hydrogenated phenols and high molecular weight alcohols to soap-mineral oil bases.

Pages 4888-4890 (R113209 IVd/120) - Item 188

German Patent Application.

Preparation of extreme pressure lubricants by treatment with sulfur or sulfur-containing compounds of mineral oil obtained from acid sludge.

Pages 4891-4893 (R115016 IVd/23c) - Item 189

German Patent application on the use of small amounts of crude or purified ozokerite, together with voltolized fats as dispersing aids for sludge in oils.

Pages 4894-4896 (R117368 IVd/23b) - Item 190

German Patent application on the separation of paraffins from iso-paraffins in mineral oils by distillation in the presence of a high boiling or non-volatile material such as bitumen, which forms azeotropes with paraffins and which remains undistilled.

Pages 4897-4900 (R 118162) - Item 191

German Patent Application.

Preparation of extreme pressure lubricants by addition to oils of small amounts of products formed by the reaction of heavy olefins with sulfur chloride.

Pages 4901-4903 (R 118163) - Item 192

German Patent Application.

Similar to patent application under Item 191, except that the olefins used are polymerized before treatment with sulfur chloride.

Pages 4904-4905 (R118164 IVd/23e) - Item 193

German patent application similar to that under Item 191, except that the olefin used is first reacted with sulfur before treatment with sulfur chloride.

Pages 4906-4907 (R118847 IVd/120) - Item 194

German patent application on the preparation of polymer oils by polymerization of olefins using as the catalyst a polymer oil into which aluminum chloride has been sublimed.

Pages 4908-4911 (R109307 IVd/120) - Item 195

German patent application.

Polymerization of olefins to make polymer oil using as a catalyst aluminum chloride which has been sublimed into the feed stock under conditions of rapid stirring.

Pages 4912-4915 (R114137 IVd/12o) - Item 196

German Patent Application.

Step-wise polymerization of olefins with aluminum chloride catalyst to make polymer oils.

Pages 4916-4918 (R115924 IVd/12o) - Item 197

German Patent Application.

Preparation of lube oils by polymerization of olefins in the presence of partly chlorinated high boiling hydrocarbons with aluminum chloride as the catalyst.

Pages 4919-4920 (R116691 IVd/12o) - Item 198

German Patent Application.

Clay pretreatment of olefin feed stock to improve color and Conradson carbon of polymer oil.

Pages 4926-4927 (R109063 IVc/39b) - Item 201

German Patent Application.

Use of spent bleaching earths after extraction of its oil content as filler for rubber and plastics.

Pages 4928-4929 (R109980 IVc/39c) - Item 202

German Patent Application.

Process for preparation of synthetic rubber in which the feed stock is emulsified at the latest during an early stage in the polymerization by suitable water-soluble emulsifiers prepared from mineral oils or bitumens.

Pages 4930-4933 (R109981 IVc/39b) - Item 203

Fillers for rubber consisting of gelled oils made by treatment of the oil with aluminum salts of fatty acids or naphthenic acids, chlorinated rubber and other materials that behave similarly.

Pages 4934-4938 (R112859 IVc/39b) - Item 204

Use of concentrated sulfuric acid soluble hydrocarbons from sludge as fillers for rubber.

Pages 4942-4947 (R150937 IVc/39b) - Item 206

Condensation products of aromatic extracts with formaldehyde (using acid catalyst) as rubber fillers.

Pages 4948-4952 (M155231 IV/c 396) - Item 207

Use of spent bleaching earth without removal of the oil as filler for rubber goods.

Page 4954 - Item 217

Flow sheet of synthetic lube plant at Harburg.

Page 4956 - Item 216

Flow sheet of wax plant Harburg - Part IV.