

APPENDIX

Original
manuscript
page no.

TOM Reel 101, Doc. PG-21576 - NID

Introduction	1
Scope of present invention.....	1
Operating conditions.....	3
Example.....	5
Claims.....	5

TOM Reel 101, Doc. PG-21578 - NID

Synthesis with Iron Catalysts, September 9, 1939	1
Introduction	1
Historical development	1
Results of the present study	4
Arrangement of the apparatus	4
Preparation of the catalyst	4
Methods of preparation	4
Standard catalyst	5
The synthesis gas	6
Pressure and temperature variations	7
Durability of the catalysts	7
Reaction products	9
Yields	9
Nature of reaction products	10
Summary	11
Literature	13
Middle-Pressure Synthesis with Iron Catalysts (A Summary)	1
Introduction	1
Factors influencing the synthesis at lower temperatures	1
Catalyst	1
Induction of the catalyst	1
Operating pressures	2
Synthesis gas composition	2
Reaction products	2
Multistage operation	3

TOM Reel 101, Doc. PG-21579 - NID

Quantitative determination of the alcohols and fatty acids in the reaction water	1
Further tests	2

TOM Reel 134, Navy 5811, Item IB-23 (First Half)

Iron catalysts	1 - 12
Introduction	1
Description of converters	1
Catalysts	1
Composition of synthesis gas	1

Appendix (cont'd.)

Original
manuscript
page no.

Influence of mode of reduction upon catalyst activity	2
Influence of catalyst upon the synthesis products	3
Influence of space velocity upon the synthesis products	3
Influence of reaction temperature upon the synthesis products	4
Influence of pressure upon the degree of saturation of the synthesis products	5
Degree of saturation of various fractions	6
Behavior of various iron catalysts.	7 - 9
Branched-chains and octane number	9
X-Ray investigations of iron catalysts.....	10
Yields from semi-plant scale experiments	11 - 12

TOM Reel 86, Bag 3979, Item 78

Introduction	1
Catalyst reduction	1
Description of plant	1
Course of reduction.....	1
Pattenhausen coke towers.....	2
Hydrogen pressure	2
Starting up the burners	2
Drying of the silica gel	2
Temperature difference in the catalyst container	2
Water content of the hydrogen	2
Water separation	3
Ammonia formation	3
Silica gel	3
Shutting down	3
CO ₂ purification	3
Catalyst arrangement	3
Synthesis plant	3
Gas and product flow	4
Pressure and quantity control of the gases	4
Hot separation	4
Corrosion prevention	4
Cold separation.....	5
Ammonia cooler.....	5
Separator	5
Heating and cooling the converters	5
Recycling pumps	6
Filling and emptying the converters	6
Cover gaskets	6
Catalyst arrangement	7
Starting up, interrupting, shutting down	7
Plate converters	7
Water recycle in the plate converters	8
Shape of the catalyst space	8

Appendix (cont'd.)

	<u>Original manuscript page no.</u>
Pressure water washing	8
Tower packing	8
Maintenance	9
Water-regulating valve	9
Turbine	9
Activated carbon plant	9
Method of operation	9
Steaming	10
Drying and cooling	10
Preheater	10
Cooler	11
Distillation	11
Oil distillation	11
Separation from alkali	11
Distillation of reaction water.....	11
Vacuum distillation	11
Control of the distillation	12
Reflux and bottoms pump	12
Steam ejector	13
Present status of the synol synthesis, further work, planning and improvements	13
Method of operation	13
Recycle processes	13
Conversion	13
Lifetime of catalyst and partial pressure of water	13
Increase of alcohol content	13
Heat transfer	14
Separation of products	14
Gas usage	14
Recycle and sumpf phase	14
Conversion and yields	15
Catalysts	16
Converter construction and various technical details	19

Research and Development Division
 U.S. Department of the Interior
 Bureau of Mines
 Central Experiment Station
 Pittsburgh, Pennsylvania
 May 22, 1946
 igf