



Cairo University

UNREACTED PROPYLENE RECOVERY IN POLYPROPYLENE PRODUCTION INDUSTRY

By
MAHMOUD RAMADAN MASRY HELAL

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF SCIENCE
In
CHEMICAL ENGINEERING

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Under the Supervision of

Prof. Dr. **MAI MOHAMED FOUAD**
Professor Of
Chemical Engineering Dept.
Cairo University

Dr. **AYAT OSSAMA GHALLAB**
Associate Professor Of
Chemical Engineering Dept.
Cairo University

Dr. **MOHAMED GAMAL MOHAMED**
Assistant Professor of
Chemical Engineering Dept.
Cairo University

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Approved by the
Examining committee:

Prof. Dr. Mai Mohamed Fouad,

Thesis Main Advisor

Prof. Dr. Ehab Fouad Abadir,

Internal Examiner

Prof. Dr. Abd El Ghani Gamal Abo Al Nour, External Examiner
National Research Center – Department of Chemical Engineering Pilot Plant

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
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Engineer: Mahmoud Ramadan Masry Helal
Date of Birth : 18 / 3 / 1991
Nationality : Egyptian
E-mail : mahmoud4644@gmail.com
Phone. : 01061973937
Address : Kafr El Sheikh
Registration Date : 1 / 10 / 2014
Awarding Date : / /
Degree : Master of Science
Department : Chemical Engineering
Supervisors : Prof. Dr. Mai Mohamed Fouad
Assoc. Prof. Dr. Ayat Ossama Ghallab
Dr. Mohamed Gamal Mohamed
Examiners : Prof. Dr. Mai Mohamed Fouad
Prof. Dr. Ehab Fouad Abadir
Prof. Dr. Abd El Ghani Gamal Abo Al Nour



Title of Thesis : UNREACTED PROPYLENE RECOVERY IN
POLYPROPYLENE PRODUCTION INDUSTRY

Key Words: Propylene recovery; Polypropylene Industry; Process Simulation;
Polymerization Process; Monomer Recycle

Summary :

This study is to achieve a proper way for recovery of unreacted propylene in propylene polymerization reaction. By using Aspen Plus V9, three modules were developed to perform a good recovery for unreacted propylene. Each module shows its ability to recover maximum amount of propylene. Each module has its different equipment and characteristic configuration. By using Aspen Capital Cost Estimator V9, differences for each module in total capital cost, total operating cost, total utilities cost, equipment cost and total installed cost were shown.

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Dedication

For my father and my mother.

Table of Contents

ACKNOWLEDGMENTS.....	I
DEDICATION	II
TABLE OF CONTENTS	III
LIST OF TABLES.....	VI
LIST OF FIGURES.....	VIII
NOMENCLATURE	XI
ABSTRACT	XII
CHAPTER 1 : INTRODUCTION	1
1.1. BASIC DESCRIPTION OF POLYPROPYLENE	1
1.2. ROLE OF ADDITIVES IN POLYPROPYLENE	2
1.3. CONCEPT OF STEREOREGULARITY	3
1.3.1. The degree of branching.....	3
1.3.2. The pendant methyl sequence.....	4
1.3.3. The stereospecific	4
1.4. TYPES OF POLYPROPYLENE	5
1.5. MOLECULAR WEIGHT OF POLYPROPYLENE	6
1.6. POLYPROPYLENE MARKET	9
1.7. FIBERS	10
1.7.1. Carpets.....	10
1.7.2. Slit tape.....	11
1.7.3. Nonwoven fabrics.....	11
1.7.4. Apparel	12
1.7.5. Cordage.....	12
1.7.6. Netting	12
1.8. INJECTION MOLDED CONSUMER PRODUCTS.....	12
1.8.1. Appliances	12
1.8.2. General consumer products	13
1.8.3. Medical applications.....	13
1.8.4. Rigid packaging.....	13
1.9. INDUSTRIAL APPLICATIONS.....	14
1.10. TRANSPORTATION.....	14
1.11. FILMS	15
1.11.1. Biaxially oriented films	15
1.11.2. Unoriented film	16
1.12. MISCELLANEOUS APPLICATIONS	16
1.13. POLYPROPYLENE CONSUMER PRODUCTS:.....	16
CHAPTER 2 : LITERATURE REVIEW	17
2.1. GENERATIONS OF ZIEGLER–NATTA CATALYSTS.....	17

2.1.1.	First generation catalysts	17
2.1.2.	Second generation catalysts.....	17
2.1.3.	Third generation catalysts.....	18
2.1.4.	Fourth generation catalysts.....	18
2.1.5.	Fifth generation catalysts.....	18
2.2.	EARLY PROCESSES	19
2.2.1.	Hercules slurry polymerization process.....	19
2.2.2.	Eastman solution polymerization process	21
2.2.3.	Rexall and Phillips polymerization processes	23
2.2.4.	Novolen polymerization process	25
2.2.5.	High yield Montedison polymerization process	26
2.3.	CURRENT PROCESSES.....	26
2.3.1.	Spheripol polymerization process	27
2.3.2.	Exxon (Sumitomo) polymerization process	28
2.3.3.	Mitsui Hypol polymerization process.....	28
2.3.4.	Unipol PP polymerization process	29
2.3.5.	BP Innovene polymerization process	30
2.3.6.	Basell Catalloy polymerization process.....	31
2.3.7.	Spherizone polymerization process	33
CHAPTER 3 : SIMULATION METHODOLOGY AND ANALYSIS		34
3.1.	THE PROBLEM STATEMENT	34
3.2.	THE FIRST MODULE	35
3.2.1.	Process description of the first module.....	38
3.3.	THE SECOND MODULE	47
3.3.1.	Process description of the second module	50
3.4.	THE THIRD MODULE	66
3.4.1.	Process description of the third module	69
CHAPTER 4 : RESULTS AND DISCUSSION		84
4.1.	DISCUSSION	84
4.1.1.	Results of the first module.....	85
4.1.2.	Results of the second module	93
4.1.3.	Results of the third module.....	101
4.2.	ECONOMIC STUDY	109
CHAPTER 5 : CONCLUSION AND RECOMMENADATIONS.....		112
5.1.	CONCLUSION	112
5.2.	FURTHER WORK	113
REFERENCES		114
APPENDIX A: FIRST MODULE STREAMS SUMMARY		119
APPENDIX B: SECOND MODULE STREAMS SUMMARY		134
APPENDIX C: THIRD MODULE STREAMS SUMMARY		158
APPENDIX D: FIRST MODULE ECONOMIC STUDY		182

APPENDIX E: SECOND MODULE ECONOMIC STUDY	183
APPENDIX F: THIRD MODULE ECONOMIC STUDY	184

List of Tables

Table 1.1: Characteristics of types of polypropylene [13]	6
Table 1.2: Major polypropylene producers	10
Table 3.1: Particle size distribution for polypropylene in the feed stream.....	34
Table 3.2: Process lines description of the first module.....	35
Table 3.3: Cost summary of the first module	36
Table 3.4: Simulation results of first cyclone (CYCLONE1) streams	39
Table 3.5: Simulation results of second cyclone (CYCLONE2) streams	40
Table 3.6: Simulation results of high pressure scrubber (HPS) streams	41
Table 3.7: Simulation results of heater (HEATER1) streams	42
Table 3.8: Simulation results of the first bag filter (B1FILTER) streams.....	43
Table 3.9: Simulation results of the second bag filter (B2FILTER) streams.....	44
Table 3.10: Simulation results of the two mixers (MIXER1) and (MIXER2) streams.	46
Table 3.11: Description of process lines in the second module	47
Table 3.12: Cost summary of the second module	48
Table 3.13: Simulation results of first cyclone (CYCLONE1) streams	51
Table 3.14: Simulation results of second cyclone (CYCLONE2) streams	52
Table 3.15: Simulation results of mixer (MIXER4) streams	53
Table 3.16: Simulation results of high pressure scrubber (HPS) streams	54
Table 3.17: Simulation results of heater (HEATER1) streams	55
Table 3.18: Simulation results of splitter (SPLIT1) streams.....	56
Table 3.19: Simulation results of first bag filter (B1FILTER) streams	57
Table 3.20: Simulation results of second bag filter (B2FILTER) streams.....	58
Table 3.21: Simulation results of mixers (MIXER1) and (MIXER2) streams.....	60
Table 3.22: Simulation results of low pressure scrubber (LPS) streams.....	61
Table 3.23: Simulation results of heater (HEATER) and compressor (MS-COMP) streams	63
Table 3.24: Simulation results of pump (PUMP) and splitter (SPLIT2) streams	65
Table 3.25: Description of process lines in the third module.....	66
Table 3.26: Cost summary of the third module	67
Table 3.27: Simulation results of splitter (SPLIT) streams.....	70
Table 3.28: Simulation results of first high pressure bag filter (B00FLTR) streams.....	71
Table 3.29: Simulation results of second high pressure bag filter (B01FLTR) streams	72
Table 3.30: Simulation results of mixer (MIXER4) streams	73
Table 3.31: Simulation results of splitter (SPLIT1) streams.....	74
Table 3.32: Simulation results of first low pressure bag filter (B1FILTER) streams	75
Table 3.33: Simulation results of second low pressure bag filter (B2FILTER) streams	76
Table 3.34: Simulation results of mixer (MIXER1) streams	77
Table 3.35: Simulation results of mixer (MIXER2) streams	78
Table 3.36: Simulation results of low pressure scrubber (LPS) streams.....	79
Table 3.37: Simulation results of heater (HEATER) streams	80
Table 3.38: Simulation results of compressor (MS-COMP) streams.....	81
Table 3.39: Simulation results of splitter (SPLIT2) streams.....	82
Table 3.40: Simulation results of heater (HEATER2) streams	83
Table A.1: First module process streams conditions first part including B1-BTM, B1FEED, B1-TOP, B2-BTM, B2FEED and B2-TOP	119

Table A.2: First module process streams conditions second part including CYC1-BTM, CYC1-TOP, CYC2-BTM, CYC2-TOP and FEED	123
Table A.3: First module process streams conditions third part including HEAT1OUT, HPS-BTM, HPS-TOP, LPS-FEED and S-TOTAL	128
Table B.1: Second module process streams conditions first part including B1-BTM, B1FEED, B1-TOP, B2-BTM, B2FEED and B2-TOP	134
Table B.2: Second module process streams conditions second part including COMP-OUT, CYC1-BTM, CYC1-TOP, CYC2-BTM, CYC2-TOP and FEED	138
Table B.3: Second module process streams conditions third part including HEAT1OUT, HPS-BTM, HPS-FEED, HPS-TOP and KO-FEED	143
Table B.4: Second module process streams conditions fourth part including KO-OUT, LPS-BTM, LPS-FEED, LPS-TOP and PUMP-DIS	147
Table B.5: Second module process streams conditions fifth part including PUMPFEED, R1, R2, S-TOTAL and WASTE	152
Table C.1: Third module process streams conditions first part including B00BTM, B00TOP, B01BTM, B01TOP, B1-BTM and B1FEED	158
Table C.2: Third module process streams conditions second part including B1-TOP, B2-BTM, B2FEED, B2-TOP, COMP-OUT and FEED	162
Table C.3: Third module process streams conditions third part including FEED1, FEED2, HPS-FEED, KO-FEED and KO-OUT	167
Table C.4: Third module process streams conditions fourth part including LPS-BTM, LPS-FEED, LPS-TOP, PUMP-DIS and PUMPFEED	171
Table C.5: Third module process streams conditions fifth part including R1, R2, S-TOTAL and WASTE	176
Table D.1: First Module Cost Summary	182
Table D.2: First Module Utility Cost	182
Table D.3: First Module Detailed Cost of Each Equipment	182
Table E.1: Second Module Cost Summary	183
Table E.2: Second Module Utility Cost	183
Table E.3: Second Module Detailed Cost of Each Equipment	183
Table F.1: Third Module Cost Summary	184
Table F.2: Third Module Utility Cost	184
Table F.3: Third Module Detailed Cost of Each Equipment	184

List of Figures

Figure 1.1: Principal processing methods for polypropylene [2]	1
Figure 1.2: Raw polypropylene resin is melted and shaped into pellets	2
Figure 1.3: Linear (A) and branched (B) addition of propylene monomer to the growing PP chain.....	3
Figure 1.4: Head-to-tail (A) and tail-to-tail (B) addition of propylene to the growing PP chain	4
Figure 1.5: Addition of propylene to the growing PP chain to the same (A) and opposite (B) hand	4
Figure 1.6: Schematic illustrations of different configurations of PP (A) isotactic, (B) syndiotactic and (C) atactic	5
Figure 1.7: Types of industrial polypropylene in market in 2008 [14]	6
Figure 1.8: Extrusion plastometer	7
Figure 1.9: Mw vs. MFR for PP homopolymer [19].....	8
Figure 1.10: Growth of polypropylene.....	9
Figure 1.11: Carpet components shows face yarn.....	10
Figure 1.12: Car components made of polypropylene	14
Figure 2.1: Hercules slurry polymerization process.....	20
Figure 2.2: Eastman solution polymerization process [40].....	22
Figure 2.3: Rexall process	23
Figure 2.4: Phillips process	24
Figure 2.5: Novolen process.....	25
Figure 2.6: High yield Montedison PP process	26
Figure 2.7: Spheripol process	27
Figure 2.8: Exxon (Sumitomo) process.....	28
Figure 2.9: Mitsui Hypol process	28
Figure 2.10: Unipol PP process	29
Figure 2.11: BP Innovene diagram with horizontal and mechanically stirred reactor ..	30
Figure 2.12: BP Innovene process.....	31
Figure 2.13: Basell Catalloy process	32
Figure 2.14: Spherizone process.....	33
Figure 3.1: Flow sheet of the first module	37
Figure 3.2: First cyclone (CYCLONE1)	38
Figure 3.3: Second cyclone (CYCLONE2).....	40
Figure 3.4: High pressure scrubber (HPS)	41
Figure 3.5: Heater (HEATER1)	42
Figure 3.6: Bag filter (B1FILTER)	43
Figure 3.7: Bag filter (B2FILTER)	44
Figure 3.8: Mixer (MIXER1)	45
Figure 3.9: Mixer (MIXER2)	45
Figure 3.10: Flow sheet of the second module.....	49
Figure 3.11: First cyclone (CYCLONE1)	51
Figure 3.12: Second cyclone (CYCLONE2).....	52
Figure 3.13: Mixer (MIXER4)	53
Figure 3.14: High pressure scrubber (HPS)	54
Figure 3.15: heater (HEATER1)	55
Figure 3.16: Splitter (SPLIT1)	56

Figure 3.17: First bag filter (B1FILTER).....	57
Figure 3.18: Second bag filter (B2FILTER)	58
Figure 3.19: Mixer (MIXER1)	59
Figure 3.20: Mixer (MIXER2)	59
Figure 3.21: Low pressure scrubber (LPS).....	61
Figure 3.22: Heater (HEATER)	62
Figure 3.23: Compressor (MS-COMP)	62
Figure 3.24: Pump (PUMP).....	64
Figure 3.25: Splitter (SPLIT2)	64
Figure 3.26: Flow sheet of the third module	68
Figure 3.27: Splitter (SPLIT)	70
Figure 3.28: First high pressure bag filter (B00FLTR)	71
Figure 3.29: Second high pressure bag filter (B01FLTR).....	72
Figure 3.30: Mixer (MIXER4)	73
Figure 3.31: Splitter (SPLIT1)	74
Figure 3.32: First low pressure bag filter (B1FILTER)	75
Figure 3.33: Second low pressure bag filter (B2FILTER)	76
Figure 3.34: Mixer (MIXER1)	77
Figure 3.35: Mixer (MIXER2)	78
Figure 3.36: Low pressure scrubber (LPS).....	79
Figure 3.37: Heater (HEATER)	80
Figure 3.38: Compressor (MS-COMP)	81
Figure 3.39: Splitter (SPLIT2)	82
Figure 3.40: Heater (HEATER2)	83
Figure 4.1: Mass flow rate of recovered propylene stream in the high pressure section for the first module	85
Figure 4.2: Mass flow rate of recovered propylene stream in the low pressure section for the first module	85
Figure 4.3: Mass flow rate of separated polypropylene stream in the first module	86
Figure 4.4: Flow sheet of the first module showing mass flow rate distribution	87
Figure 4.5: Flow sheet of the first module showing pressure distribution	88
Figure 4.6: Flow sheet of the first module showing temperature distribution	89
Figure 4.7: Flow sheet of the first module showing molar flow rate distribution	90
Figure 4.8: Flow sheet of the first module showing vapor fraction distribution	91
Figure 4.9: Flow sheet of the first module showing volume flow rate distribution	92
Figure 4.10: Mass flow rate of recovered propylene stream in the second module	93
Figure 4.11: Mass flow rate of waste stream in the second module	93
Figure 4.12: Mass flow rate of separated polypropylene stream in the second module	94
Figure 4.13: Flow sheet of the second module showing mass flow rate distribution	95
Figure 4.14: Flow sheet of the second module showing pressure distribution	96
Figure 4.15: Flow sheet of the second module showing temperature distribution	97
Figure 4.16: Flow sheet of the second module showing molar flow rate distribution	98
Figure 4.17: Flow sheet of the second module showing vapor fraction distribution	99
Figure 4.18: Flow sheet of the second module showing volume flow rate distribution	100
Figure 4.19: Mass flow rate of recovered propylene stream in the third module	101
Figure 4.20: Mass flow rate of waste stream in the third module	101
Figure 4.21: Mass flow rate of separated polypropylene stream in the third module	102
Figure 4.22: Flow sheet of the third module showing mass flow rate distribution	103
Figure 4.23: Flow sheet of the third module showing pressure distribution	104

Figure 4.24: Flow sheet of the third module showing temperature distribution	105
Figure 4.25: Flow sheet of the third module showing molar flow rate distribution.....	106
Figure 4.26: Flow sheet of the third module showing vapor fraction distribution.....	107
Figure 4.27: Flow sheet of the third module showing volume flow rate distribution..	108
Figure 4.28: Total capital cost of the three modules	109
Figure 4.29: Total operating cost of the three modules.....	109
Figure 4.30: Total utilities cost of the three modules	110
Figure 4.31: Equipment cost of the three modules	110
Figure 4.32: Total installed cost of the three modules	111
Figure 5.1: Comparison between second and third module for total mass flow rate of recovered monomer stream	112
Figure 5.2: Comparison between second and third module for total mass flow rate of discharged stream outside the system and considered as a waste stream.....	113

Nomenclature

Abbreviations

BOPP	Biaxially oriented Polypropylene
FRR	Flow rate ratio
GPC	Gel permeation chromatography
HECO	Heterophasic copolymer
HP	Homopolymer
IBC	Intermediate bulk container
MFR	Melt flow rate
MWD	Molecular weight distribution
MZCR	Multi-zone circulating reactor
PDI	Polydispersity index
PP	Polypropylene
RACO	Random copolymer
SHAC	Shell high activity catalysts