



PROCESS ECONOMICS PROGRAM

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Abstract

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ETHYLENE FROM REFINERY GAS

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Refinery gas is a mixture of C₄-and-lighter hydrocarbons, nitrogen, carbon oxides, and sulfur oxides. For ethylene production, the most important components in the refinery gas are ethylene, ethane, propane, and propylene. The economics developed in this report are for the following processes:

- Ethylene from refinery gas, including steam cracking of the ethane and propane originally present in the feed stream.
- Ethylene from refinery gas by the expander process.
- Ethylene from refinery gas by the bimetallic salt complexing process (analogous to Tenneco's ESEP[®] process).
- Ethylene from refinery gas plus ethane-propane feed supplements.

Additionally, the newly developed costs are compared with the costs for making ethylene by steam cracking of ethane, ethane-propane, and propane supplied from non-refinery-gas-related sources. The comparison indicates that there is an economic advantage in using refinery gas, wholly or partly, as a feedstock for ethylene production. The most economical processes are the bimetallic salt complexing and expander technologies. But a substantial portion of the production economy in these processes results from credits of by-products originally present in the refinery gas stream. Furthermore, the ethylene production from these processes is limited to 90 to 95% of the ethylene originally present in the feed stream. If additional ethylene is required, it is necessary to include steam cracking of ethane, propane, or both in the production scheme.

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by JAMES J. L. MA

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For detailed marketing data and information, the reader is referred to one of the SRI programs specializing in marketing research. The CHEMICAL ECONOMICS HANDBOOK Program covers most major chemicals and chemical products produced in the United States and the WORLD PETROCHEMICALS Program covers major hydrocarbons and their derivatives on a worldwide basis. In addition, the SRI DIRECTORY OF CHEMICAL PRODUCERS services provide detailed lists of chemical producers by company, product, and plant for the United States and Western Europe.

CONTENTS

1	INTRODUCTION	1
2	SUMMARY	3
	General Aspects	3
	Ethylene Production and Plant Capacities	3
	Ethylene Feedstocks	3
	Refinery Gas as an Ethylene Feedstock	4
	Economic Aspects	5
	Technical Aspects	11
	Steam Cracking Process and Refinery Gas Feed	11
	Expander Process	13
	Bimetallic Salt Complexing Process	14
3	INDUSTRY STATUS	15
	Plant Capacities	15
	Production	15
	Feedstocks	19
	Refinery Gas as a Feedstock	19
	Potential Ethylene from Refinery Gas	24
4	ETHYLENE FROM REFINERY GAS, INCLUDING STEAM CRACKING OF ETHANE AND PROPANE	33
	Review of Process	33
	Process Description	36
	Cracking and Quenching (100)	36
	Compression and Acid Gases Removal (200)	37
	Drying and Demethanization (300)	37
	Separation (400)	38
	Refrigeration	40
	Process Discussion	49
	Cost Estimates	50
	Capital Costs	50
	Production Costs	50
5	ETHYLENE FROM REFINERY GAS BY THE EXPANDER PROCESS	61
	Review of Process	61
	Process Description	64
	Compression and Acid Gases Removal (100)	64
	Expanding and Demethanization (200)	65

CONTENTS

5	ETHYLENE FROM REFINERY GAS BY THE EXPANDER PROCESS (continued)	
	Separation (300)	65
	Process Discussion	72
	Cost Estimates	73
	Capital Costs	73
	Production Costs	74
6	ETHYLENE FROM REFINERY GAS BY THE BIMETALLIC SALT COMPLEXING PROCESS	81
	Chemistry	81
	Review of Process	83
	Process Description	89
	Acid Gases Removal and Deethanization (100)	89
	Complexing and Desorption (200)	90
	Separation (300)	91
	Process Discussion	99
	Cost Estimates	99
	Capital Costs	99
	Production Costs	100
7	ETHYLENE FROM REFINERY GAS PLUS SUPPLEMENTARY ETHANE AND PROPANE FEED	109
	Process Description	109
	Cost Estimates	117
	Capital Costs	117
	Production Costs	117
	Effect of Plant Capacity on Costs	118
8	COST UPDATE FOR ETHYLENE BY STEAM CRACKING OF ETHANE, ETHANE-PROPANE, AND PROPANE FEEDSTOCKS	127
APPENDIX A	DESIGN AND COST BASIS	139
APPENDIX B	SPECIFICATIONS	143
CITED REFERENCES	149

ILLUSTRATIONS

4.1	Ethylene from Refinery Gas, Including Steam Cracking of Ethane and Propane Flow Sheet	155
4.2	Ethylene from Refinery Gas, Including Steam Cracking of Ethane and Propane Effect of Plant Capacity on Capital Investment	55
4.3	Ethylene from Refinery Gas, Including Steam Cracking of Ethane and Propane Effect of Operating Level, Plant Capacity, and Refinery Gas Price on Ethylene Value	59
5.1	Ethylene from Refinery Gas by the Expander Process A Schematic Diagram of Expander Thermodynamics	62
5.2	Ethylene from Refinery Gas by the Expander Process Flow Sheet	161
5.3	Ethylene from Refinery Gas by the Expander Process Effect of Plant Capacity on Capital Investment	77
5.4	Ethylene from Refinery Gas by the Expander Process Effect of Operating Level, Plant Capacity, and Refinery Gas Price on Ethylene Value	80
6.1	Ethylene from Refinery Gas by the Bimetallic Salt Complexing Process Flow Sheet	167
6.2	Ethylene from Refinery Gas by the Bimetallic Salt Complexing Process	106
6.3	Ethylene from Refinery Gas by the Bimetallic Salt Complexing Process Effect of Operating Level, Plant Capacity, and Refinery Gas Price on Ethylene Value	107
7.1	Ethylene from Refinery Gas Plus Supplementary Ethane and Propane Feed Effect of Plant Capacity on Total Fixed Capital and Ethylene Value	126
8.1	Effect of Feedstock and Plant Capacity on Total Fixed Capital	136
8.2	Effect of Feedstock and Plant Capacity on Ethylene Value	137

TABLES

2.1	Summary of Study Cases Plant Capacities, Processes, and Feedstocks	7
2.2	Ethylene from Refinery Gas, Ethane, Ethane-Propane and Propane Feedstocks Summary of Economics	9
3.1	World Ethylene Capacity	16
3.2	Ethylene Plant Capacities Feeding Solely or Partly Refinery Gases	21
3.3	Refinery Gas Compositions	24
3.4	Ethylene Recovery Potential Estimate for Selected Petroleum Refineries in Non-Communist Countries	25
4.1	Ethylene from Refinery Gas, Including Steam Cracking of Ethane and Propane Design Bases	41
4.2	Ethylene from Refinery Gas, Including Steam Cracking of Ethane and Propane Major Equipment	42
4.3	Ethylene from Refinery Gas, Including Steam Cracking of Ethane and Propane Utilities Summary	45
4.4	Ethylene from Refinery Gas, Including Steam Cracking of Ethane and Propane Stream Flows	46
4.5	Ethylene from Refinery Gas, Including Steam Cracking of Ethane and Propane Summary of Waste Streams	48
4.6	Ethylene from Refinery Gas, Including Steam Cracking of Ethane and Propane Capital Investment	53
4.7	Ethylene from Refinery Gas, Including Steam Cracking of Ethane and Propane Production Costs	56
4.8	Ethylene from Refinery Gas, Including Steam Cracking of Ethane and Propane Material Prices Used in Production Cost Estimates	58

TABLES

5.1	Ethylene from Refinery Gas by the Expander Process Major Equipment	67
5.2	Ethylene from Refinery Gas by the Expander Process Utilities Summary	69
5.3	Ethylene from Refinery Gas by the Expander Process Stream Flows	70
5.4	Ethylene from Refinery Gas by the Expander Process Summary of Waste Streams	71
5.5	Ethylene from Refinery Gas by the Expander Process Capital Investment	76
5.6	Ethylene from Refinery Gas by the Expander Process Production Costs	78
6.1	Ethylene from Refinery Gas by the Bimetallic Salt Complexing Process Summary of Patents	84
6.2	Ethylene from Refinery Gas by the Bimetallic Salt Complexing Process Major Equipment	92
6.3	Ethylene from Refinery Gas by the Bimetallic Salt Complexing Process Utilities Summary	95
6.4	Ethylene from Refinery Gas by the Bimetallic Salt Complexing Process Major Stream Flows	96
6.5	Ethylene from Refinery Gas by the Bimetallic Salt Complexing Process Summary of Waste Streams	98
6.6	Ethylene from Refinery Gas by the Bimetallic Salt Complexing Process Capital Investment	103
6.7	Ethylene from Refinery Gas by the Bimetallic Salt Complexing Process Production Costs	104

TABLES

7.1	Ethylene from Refinery Gas Plus Supplementary Ethane and Propane Feed Major Equipment	111
7.2	Ethylene from Refinery Gas Plus Supplementary Ethane and Propane Feed Utilities Summary	113
7.3	Ethylene from Refinery Gas Plus Supplementary Ethane and Propane Feed Major Equipment	114
7.4	Ethylene from Refinery Gas Plus Supplementary Ethane and Propane Feed Utilities Summary	116
7.5	Ethylene from Refinery Gas Plus Supplementary Ethane and Propane Feed Capital Investment (500 Million lb/yr Ethylene)	120
7.6	Ethylene from Refinery Gas Plus Supplementary Ethane and Propane Feed Capital Investment (1,000 Million lb/yr Ethylene)	171
7.7	Ethylene from Refinery Gas Plus Supplementary Ethane and Propane Feed Production Costs	122
7.8	Ethylene from Refinery Gas Plus Supplementary Ethane and Propane Feed Production Costs	124
8.1	Summary of Investment Costs for Ethylene Production by Steam Cracking of Ethane, Ethane-Propane, and Propane Feedstocks	128
8.2	Ethylene from Ethane by Steam Cracking Production Costs	131
8.3	Ethylene from Ethane-Propane (50 wt% each) by Steam Cracking Production Costs	132
8.4	Ethylene from Propane by Steam Cracking Production Costs	134

TABLES

8.5	Summary of the Major Production Cost Elements for Ethylene by Steam Cracking of Ethane, Ethane-Propane, and Propane Feedstocks	135
B.1	Pipeline Specifications and Typical Inplant Analysis of Polymer Grade Ethylene	145
B.2	Specifications and Typical Inplant Analysis of Polymer Grade Propylene	146
B.3	Specifications and Typical Inplant Analysis of Chemical Grade Propylene	147