

CONTENTS

1. <b>Overview</b>	<b>1</b>
2. <b>Technological Improvements in Ethylene Production</b>	<b>5</b>
Introduction	5
Improvements of Conventional Processes	5
Radical Changes in the Process	6
Direct Cracking of Crude Oils	6
3. <b>The Ethylene Industry and Its Sources of Supply</b>	<b>13</b>
Introduction	13
New Sources of Raw Materials for Petrochemicals	14
Sources of Raw Materials for Ethylene Production	17
4. <b>Projections and Uses</b>	<b>25</b>
Introduction	25
Trends in U.S. Ethylene Production	28
Yield	31
Major Trends	32
The World Ethylene Industry	35
5. <b>Alternative Feedstocks</b>	<b>37</b>
Introduction	37
Independent Variables	38
Definition of Processes Used	40
Ethylene from Crude Oil	40
Ethylene from Sugar Cane	41
Acetylene from Coal (Arc Process)	43
Acetylene to Vinyl Chloride Monomer	45
Ethylene to Vinyl Chloride Monomer	47
6. <b>Cost Comparisons</b>	<b>49</b>
General Procedure	49
Ethylene from Naphtha	51
Ethylene from Cane Sugar	53
Acetylene from Coal	55
VCM from Acetylene	56

VCM from Ethylene	56
Preparation and Presentation of Results	58
Discussion	67
<b>7. Impact of Technology Improvement</b>	<b>71</b>
Introduction	71
Ethylene from Crude Oil	71
Ethylene from Biomass	72
Ethylene/Acetylene from Coal	72
<b>8. Naphtha Feedstock Price Projection</b>	<b>75</b>
Introduction	75
Theory of Refinery Cost Allocation	75
Product Price Forecasts	81
<b>9. The MITRE Full Life-Cycle Cost Model</b>	<b>85</b>
<b>10. Historic Cost/Price Trends</b>	<b>93</b>
References	97
Bibliography	99
Index	101