Abstract

Process Economics Program Report No. 203

ALKANE DEHYDROGENATION AND AROMATIZATION

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Propylene, isobutene, and BTX (benzene, toluene, and xylenes) have traditionally been recovered as by-products of petroleum and petrochemical operations. On-purpose production of these olefins and aromatics has become more attractive as less costly supplies from traditional sources become inadequate to meet projected requirements. This report covers the technologies and economics for three alkane dehydrogenation and aromatization processes - CatofinT, Oleflex^R, and Cyclar^R - and examines the driving forces behind these on-purpose technologies.

For propylene production from propane, the primary economic incentive increases with increasing price differential between the feed and the product. Isobutene produced from isobutane is primarily used as a feedstock for MTBE, which has become the fastest growing large volume chemical in the world as a result of increasing demand for less polluting fuels and high octane gasoline. The traditionally, less expensive supplies of isobutene are inadequate to meet projected demand. There is no apparent long-term shortage of BTX worldwide. Processes that convert LPG and light naphtha to BTX are likely to be attractive only in countries with abundant supplies of low-cost LPG, high demand for BTX, and regionally inadequate supply from traditional sources.

Supply/demand balances for propylene, isobutene and BTX worldwide are also included. This report will give chemical producers and refiners an understanding of dehydrogenation and aromatization technologies, economics, and market dynamics to identify future opportunities.
CONTENTS

1 INTRODUCTION 1-1

2 SUMMARY 2-1
   GENERAL ASPECTS 2-1
   TECHNICAL ASPECTS 2-1
      Alkane Dehydrogenation 2-1
      STAR Process 2-2
      Catofin Process 2-2
      Oleflex Process 2-4
      Alkane Aromatization 2-4
   ECONOMIC ASPECTS 2-5
      Alkane Dehydrogenation 2-5
      Propane Dehydrogenation 2-5
      Isobutane Dehydrogenation 2-5
      Alkane Aromatization 2-6

3 INDUSTRY STATUS 3-1
   PROPYLENE AND ISOBUTENE 3-1
      Ethylene Manufacture 3-1
      Petroleum Refining 3-2
      Propylene 3-2
      Isobutene 3-3
      Propylene Oxide 3-3
      Propylene Supply and Demand 3-3
      Propylene Supply 3-3
      Propylene Demand 3-7
      Isobutene Supply and Demand 3-8
      Isobutene Supply 3-9
      Isobutene Demand 3-11
   BTX INDUSTRY 3-11
      Benzene 3-11
      Toluene 3-13
      Xylenes 3-17
      Para-xylene 3-17
      Ortho-xylene 3-19
CONTENTS (Continued)

3  INDUSTRY STATUS (Continued)
   On-Purpose Production of BTX 3-20

4  ALKANE DEHYDROGENATION TECHNICAL REVIEW  4-1
   CHEMISTRY  4-1
      Catalytic Dehydrogenation  4-1
      Oxidative Dehydrogenation  4-2
   REVIEW OF PATENTS  4-5
   COMMERCIAL PROCESSES  4-6
      Phillips STAR  4-6
      Houdry Catofin  4-7
      UOP Oleflex  4-8

5  PROPYLENE FROM PROPANE BY THE CATOFIN PROCESS  5-1
   PROCESS DESCRIPTION  5-1
      Dehydrogenation (Section 100)  5-1
      Hydrogen Recovery (Section 200)  5-3
      Purification (Section 300)  5-3
   PROCESS DISCUSSION  5-9
      Choice of Design Base  5-9
      Reactor Sizing and Catalyst Regeneration  5-9
      Hydrogen Recovery  5-9
      C\textsubscript{3} Splitter Design  5-10
      Materials of Construction  5-10
   COST ESTIMATES  5-11
      Capital Investment  5-11
      Production Costs  5-11

6  ISOBUTENE FROM ISOBUTANE BY THE OLEFLEX PROCESS  6-1
   PROCESS DESCRIPTION  6-1
      Reaction and Regeneration (Section 100)  6-3
      Product Recovery (Section 200)  6-3
         Hydrogen Recovery  6-5
         C\textsubscript{4} Recovery  6-5
      Storage  6-5
CONTENTS (Continued)

6 ISOBUTENE FROM ISOBUTANE BY THE OLEFLEX PROCESS (Continued)

PROCESS DISCUSSION 6-11
  Feed Pretreatment 6-11
  Reaction 6-11
  Reactor Product Treatment 6-11
  Catalyst Regeneration 6-11
  Product Recovery 6-11
    Hydrogen Recovery 6-12
    Isobutene Recovery 6-14
  Materials of Construction 6-14
  Environmental and Safety Aspects 6-14
    Regeneration Off-Gas 6-14
    Catalyst 6-15

COST ESTIMATES 6-15
  Capital Investment 6-15
  Production Costs 6-15

7 ALKANE AROMATIZATION 7-1

PROCESS REVIEW 7-1
  Thermodynamics 7-1
  Catalysts 7-2
    Monofunctional Catalyst 7-2
    Dual-Function Catalyst 7-3
  Potential Commercial Processes 7-4
    Cyclar Process 7-4
    Feedstocks 7-4
    Process Conditions and Yields 7-5
  Process Configuration 7-7
  Aroforming Process 7-7
    Process Yields 7-8
    Process Configuration 7-8
  M2-forming Process 7-8
  Z-forming Process 7-9
  Shell Process 7-9
CONTENTS (Concluded)

7 ALKANE AROMATIZATION (Continued)

PROCESS DESCRIPTION 7-10
  Reaction and Regeneration (Section 100) 7-10
  Product Recovery (Section 200) 7-10

PROCESS DISCUSSION 7-17
  Reaction Section 7-17
  Hydrogen Recovery 7-17
  Liquid Recovery 7-17

COST ESTIMATES 7-18
  Capital Investment 7-18
  Production Cost 7-18

APPENDIX A: PATENT SUMMARY TABLES A-1
APPENDIX B: DESIGN AND COST BASES B-1
APPENDIX C: CITED REFERENCES C-1
APPENDIX D: PATENT REFERENCES BY COMPANY D-1
APPENDIX E: PROCESS FLOW DIAGRAMS E-1
ILLUSTRATIONS

4.1 ALKANE DEHYDROGENATION
DEHYDROGENATION OF PARAFFINS TO OLEFINS 4-3

4.2 PROPYLENE BY CATALYTIC DEHYDROGENATION OF PROPANE
EFFECT OF PROPANE CONVERSION ON SELECTIVITY TO PROPYLENE 4-4

5.1 PROPYLENE FROM PROPANE BY
CATOFIN DEHYDROGENATION PROCESS
PROCESS FLOW DIAGRAM E-3

5.2 PROPYLENE FROM PROPANE BY THE CATOFIN PROCESS
EFFECT OF PLANT CAPACITY ON INVESTMENT COST 5-17

5.3 PROPYLENE FROM PROPANE BY THE CATOFIN PROCESS
RETURN ON INVESTMENT VS. PRICE DIFFERENCE BETWEEN PROPYLENE AND PROPANE 5-18

6.1 ISOBUTYLENE FROM ISOBUTANE
BY THE OLEFLEX PROCESS
PROCESS FLOW DIAGRAM E-5

6.2 ISOBUTENE FROM ISOBUTANE BY THE OLEFLEX PROCESS
OLEFLEX REFRIGERATION SECTION 6-4

6.3 ISOBUTENE FROM ISOBUTANE BY THE OLEFLEX PROCESS
PARTIAL CONDENSATION CRYOGENIC PROCESS 6-6

6.4 ISOBUTENE FROM ISOBUTANE BY THE OLEFLEX PROCESS
HYDROGEN PURITY VS. RECOVERY IN A CRYOGENIC SYSTEM 6-13

6.5 ISOBUTENE FROM ISOBUTANE BY THE OLEFLEX PROCESS
SENSITIVITY OF MTBE VALUE TO ISOBUTENE AND METHANOL COSTS 6-22

7.1 BTX PRODUCTION FROM PROPANE BY THE CYCLAR PROCESS
PROCESS FLOW DIAGRAM E-7

7.2 ALKANE AROMATIZATION
HYDROGEN PRICE SENSITIVITY BASED ON
BTX PRODUCTION FROM PROPANE 7-25
### TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>DEHYDROGENATION TECHNOLOGIES COMPARISON</td>
<td>2-3</td>
</tr>
<tr>
<td>2.2</td>
<td>PROPYLENE PRODUCTION FROM PROPANE BY THE CATOFIN PROCESS</td>
<td>2-7</td>
</tr>
<tr>
<td></td>
<td>MANUFACTURING COST SUMMARY</td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>ISOBUTENE PRODUCTION FROM ISOBUTANE BY THE OLEFLEX PROCESS</td>
<td>2-8</td>
</tr>
<tr>
<td></td>
<td>MANUFACTURING COST SUMMARY</td>
<td></td>
</tr>
<tr>
<td>2.4</td>
<td>BTX PRODUCTION FROM PROPANE BY THE CYCLAR PROCESS</td>
<td>2-9</td>
</tr>
<tr>
<td></td>
<td>MANUFACTURING COST SUMMARY</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>ETHYLENE, PROPYLENE, AND ISOBUTENE YIELDS FROM ETHYLENE CRACKERS</td>
<td>3-1</td>
</tr>
<tr>
<td>3.2</td>
<td>WORLD PROPYLENE CAPACITY</td>
<td>3-4</td>
</tr>
<tr>
<td>3.3</td>
<td>STATUS OF PROPANE HYDROGENATION UNITS</td>
<td>3-6</td>
</tr>
<tr>
<td>3.4</td>
<td>GLOBAL PERCENT OF PROPYLENE CONSUMED IN CHEMICALS</td>
<td>3-8</td>
</tr>
<tr>
<td>3.5</td>
<td>GLOBAL ISOBUTENE AND MTBE DEMAND</td>
<td>3-9</td>
</tr>
<tr>
<td>3.6</td>
<td>STATUS OF ISOBUTANE DEHYDROGENATION UNITS</td>
<td>3-10</td>
</tr>
<tr>
<td>3.7</td>
<td>ISOBUTENE CONSUMED IN CHEMICALS BY REGION</td>
<td>3-11</td>
</tr>
<tr>
<td>3.8</td>
<td>GLOBAL BENZENE SUPPLY AND DEMAND FOR CHEMICAL USES</td>
<td>3-13</td>
</tr>
<tr>
<td>3.9</td>
<td>WORLD PARAXYLENE SUPPLY AND DEMAND</td>
<td>3-16</td>
</tr>
<tr>
<td>3.10</td>
<td>WORLD PARAXYLENE SUPPLY AND DEMAND</td>
<td>3-18</td>
</tr>
<tr>
<td>3.11</td>
<td>WORLD ORTHOXYLENE SUPPLY AND DEMAND</td>
<td>3-20</td>
</tr>
<tr>
<td>4.1</td>
<td>ALKANE DEHYDROGENATION PATENT SUMMARY</td>
<td>A-3</td>
</tr>
<tr>
<td>5.1</td>
<td>PRODUCTION OF PROPYLENE FROM PROPANE BY CATOFIN DEHYDROGENATION PROCESS</td>
<td>5-2</td>
</tr>
<tr>
<td></td>
<td>DESIGN BASES AND ASSUMPTIONS</td>
<td></td>
</tr>
<tr>
<td>5.2</td>
<td>PROPYLENE FROM PROPANE BY CATOFIN DEHYDROGENATION PROCESS</td>
<td>5-4</td>
</tr>
<tr>
<td></td>
<td>MAJOR EQUIPMENT</td>
<td></td>
</tr>
<tr>
<td>5.3</td>
<td>PRODUCTION OF PROPYLENE FROM PROPANE BY CATOFIN DEHYDROGENATION PROCESS</td>
<td>5-6</td>
</tr>
<tr>
<td></td>
<td>STREAM FLOWS</td>
<td></td>
</tr>
</tbody>
</table>
5.4 PROPYLENE FROM PROPANE BY CATOFIN DEHYDROGENATION PROCESS UTILITIES SUMMARY 5-8
5.5 PROPYLENE FROM PROPANE BY CATOFIN DEHYDROGENATION PROCESS TOTAL CAPITAL INVESTMENT 5-13
5.6 PROPYLENE FROM PROPANE BY CATOFIN DEHYDROGENATION PROCESS CAPITAL INVESTMENT BY SECTION 5-14
5.7 PROPYLENE FROM PROPANE BY CATOFIN DEHYDROGENATION PROCESS PRODUCTION COSTS 5-15
6.1 ISOBUTYLENE FROM ISOBUTANE BY THE OLEFLEX PROCESS DESIGN BASES AND ASSUMPTIONS 6-2
6.2 ISOBUTENE FROM ISOBUTANE BY THE OLEFLEX PROCESS MAJOR EQUIPMENT 6-7
6.3 ISOBUTENE FROM ISOBUTANE BY THE OLEFLEX PROCESS STREAM FLOWS 6-9
6.4 ISOBUTENE FROM ISOBUTANE BY THE OLEFLEX PROCESS UTILITIES SUMMARY 6-10
6.5 ISOBUTENE FROM ISOBUTANE BY THE OLEFLEX PROCESS TOTAL CAPITAL INVESTMENT 6-17
6.6 ISOBUTENE FROM ISOBUTANE BY THE OLEFLEX PROCESS CAPITAL INVESTMENT BY SECTION 6-18
6.7 ISOBUTENE FROM ISOBUTANE BY OLEFLEX DEHYDROGENATION PROCESS PRODUCTION COSTS 6-19
6.8 ISOBUTENE FROM ISOBUTANE BY THE OLEFLEX PROCESS 6-21
7.1 ALKANE AROMATIZATION PATENT SUMMARY A-15
7.2 TEMPERATURE REQUIREMENTS OF PARAFFIN CONVERSION 7-2
7.3 EFFECT OF PRESSURE ON PRODUCT YIELDS OF CYCLAR PROCESS 7-5
### TABLES (Concluded)

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.4</td>
<td>CYCLAR PROCESS LIQUID PRODUCT</td>
<td>7-6</td>
</tr>
<tr>
<td>7.5</td>
<td>ALKANE AROMATIZATION AROMATICS FROM PROPANE BY THE CYCLAR PROCESS DESIGN BASES AND ASSUMPTIONS</td>
<td>7-11</td>
</tr>
<tr>
<td>7.6</td>
<td>ALKANE AROMATIZATION BTX PRODUCTION FROM LPG MAJOR EQUIPMENT</td>
<td>7-12</td>
</tr>
<tr>
<td>7.7</td>
<td>BTX PRODUCTION FROM PROPANE STREAM FLOWS</td>
<td>7-14</td>
</tr>
<tr>
<td>7.8</td>
<td>ALKANE AROMATIZATION BTX PRODUCTION FROM LPG UTILITIES SUMMARY</td>
<td>7-15</td>
</tr>
<tr>
<td>7.9</td>
<td>ALKANE AROMATIZATION PROPERTIES OF PETROLEUM-GRADE BTX</td>
<td>7-16</td>
</tr>
<tr>
<td>7.10</td>
<td>ALKANE AROMATIZATION BTX PRODUCTION FROM LPG TOTAL CAPITAL INVESTMENT</td>
<td>7-20</td>
</tr>
<tr>
<td>7.11</td>
<td>ALKANE AROMATIZATION BTX PRODUCTION FROM LPG CAPITAL INVESTMENT BY SECTION</td>
<td>7-21</td>
</tr>
<tr>
<td>7.12</td>
<td>ALKANE AROMATIZATION BTX PRODUCTION FROM LPG PRODUCTION COSTS</td>
<td>7-22</td>
</tr>
<tr>
<td>7.13</td>
<td>ALKANE AROMATIZATION DIFFERENCES IN ROI BETWEEN CHEMICAL-GRADE AND FUEL-VALUE HYDROGEN</td>
<td>7-24</td>
</tr>
</tbody>
</table>