CAHA Areas of Research

Chemical Products

**Raw Materials & Intermediate Chemicals**
- Oleochemicals
- Normal Paraffins
- Alpha-olefins
- Detergent Alkylates
- Higher Alcohols
- Alkylphenols
- Ethylene Oxide
- Tertiary Amines

**Primary Surfactants**
- Linear Alkylbenzene Sulfonates
- Alcohol Ether Sulfates
- Alcohol Sulfates
- Alcohol Ethoxylates
- Methyl Ester Sulfonates
- Alkylphenol Ethoxylates

**Performance Surfactants**
- Alkyl Polyglucosides
- Amine Oxides
- Alpha-olefin Sulfonates
- Betaines
- Alkoxylates & Blocks
- Imidazoline Derivatives
- Phosphate Esters
- Sarcosinates
- Sulfo succinates
- Quaternary Ammonium Cpds.
- Others

Surfactants End Uses

**Formulated Product Systems**
- Household
- Personal Care
- Institutional & Industrial

**Major Industrial End Uses**
- Agriculture
- Asphalt
- Cement
- Dispersants
- Food
- Leather
- Metalworking
- Oilfield
- Ore Flotation
- Paint
- Paper
- Petroleum Additives
- Plastics & Elastomers
- Polishes
- Slurries
- Textiles
- Wallboard

Related Topics
- Detergent Builders
- Bleach Systems

Colin A. Houston & Associates, Inc.
262 Eastgate Drive 323
Aiken, South Carolina 29803 USA
Telephone 1 803-226-0350
Email CAHA_Research@colinhouston.com
Online www.colin-houston.com
Performance surfactants typically operate as auxiliaries to enhance the features of surfactant systems. The requirements for mildness claims is expanding to encompass environmentally benign just as a sustainable raw material basis has become an essential component of its definition. With purchasing and formulating groups evaluating these added criteria, CAHA's new Mild Performance Surfactant survey will provide focus on these key industry materials as global formulations impact markets and global supply leaders become the standard for many of these products.

Mild performance surfactants are among the most successful of specialty surfactants in that they have achieved volume levels that allows their cost economics to move out of the purely specialty realm. The sulfate-free movement has given a boost to the interest in these materials. With the globalization of brands and formulas, the ability of customers to bring volume economics to specialty materials is driving a wider range of materials into the performance product arena.

Alongside these developments, formulators continue to look for methods to differentiate their products. Mild performance surfactants are where the qualities and cost structure combine to provide the necessary benefits. CAHA proposes this new study to provide an in-depth global analysis of twelve families of performance materials. This report will complement CAHA's well-received Performance Surfactants reports in Europe and the United States.

Sixteen producers will be profiled, giving an added perspective on the level of competition within the mild surfactant market.
The objective is to analyze the positioning and competition between a set of similar surfactants that are candidates today for inclusion in mild and sustainable formulations. The use of these materials is not limited to consumer products and their roles in industrial applications are described as they contribute to the economic viability of these products.

Mild Performance Surfactants are attractive to producers to complement their product line offerings and achieve higher returns where possible. The report will analyze the leading candidate materials that are competing in the formulator toolkit today. Some are more viable than others from a cost or availability standpoint and insights in the report will give customers tools to better respond to marketing challenges.
Topics analyzed in the study:

After years of debate over sustainable surfactants, formulators have begun to expand the horizon of mainline surfactants as the usual materials have fallen short of consumer expectations. Given cost constraints of formulated products, the expanded universe is being seen first in areas like skin cleansers where the burden of high material costs is more easily carried.

Mild surfactants can have special properties, such as foaming or hard water resistance, that make them attractive for applications outside their traditional personal care (hair and body shampoo) applications. For instance:

- Cocoyl isethionates, used for years in synthetic soap bars, are now displacing alcohol and alcohol ether sulfates
- Ether carboxylates in metal working fluids
- Sultaines in oil and gas
- Amphoacetates as coupling agents in I&I cleaners and car washes

This global report is designed to provide an analysis of each of the twelve families of surfactants in terms of:

- product performance: features will be summarized and compared
- differentiating performance features
- grades of the product and distinctions
- production routes including raw materials and conditions
- cost structure in terms of raw materials required, processing and handling
- pricing of the products
- sustainability profile
- consumption by end market and trends
- competing materials and systems
- major customers in each of the three main regions
- major producers, including their estimated production and market share

Sixteen company profiles will review product lines, material integration for the production of the candidates, plants and estimated capacities. Marketing efforts by segment along with a summary of the companies mild surfactant position.
EXECUTIVE SUMMARY

I. INTRODUCTION

II. SPECIAL ISSUES
   Sustainability Measures/Carbon Footprint
   Biodegradability Standards
   Environmental Profile

III. MILD PERFORMANCE SURFACTANTS
   Surfactants to be Covered:
   Anionics:
      Ether Carboxylates
      Amino acid derivatives
      Isethionates
      Sarcosinates
      Sulfosuccinates
      Taurates
   Nonionics:
      Alkyl glucamine derivatives
      Alkylpolyglucosides
   Amphoteric/Ampholytic:
      Amine Oxide
      Amphoacetates and Amphoproprionates
      Betaines
      Sultaines

   For each Surfactant:
      Technology and Product Differentiation
      Manufacturing Routes
      Raw Materials
      Product Types, Grades
      Quality
      Sustainability Profile
      Costs and Pricing
   Market Structure by Major World Region: Americas, Asia, Europe
   Producers
   Production
   Performance Characteristics
      Hydrophile/Lipophile Balance range
      Mildness/Irritability
      Foaming
      Detergency
      Formulation Compatibility
      Multifunctional Potential
      Other Unique Properties
III. MILD PERFORMANCE SURFACTANTS (continued)
   End Use Markets: Americas, Asia, Europe
   Consumption Outlook and Usage Trends by Region
      Personal Care
      Household
      Industrial
   Competing Materials and Systems
   Major Customers

IV. PRODUCER PROFILES
   Producers to be Profiled:
      Ajinomoto
      AkzoNobel
      BASF
      Clariant
      Croda
      Evonik
      Galaxy
      Global Amines Co.
      Huntsman
      Kao
      KLK
      Oxiteno
      Seppic
      Sino-Lion
      Solvay
      Stepan
      Others

   For each Producer Profile:
      Corporate Overview
      Integration
      Mild Surfactant Product Line
      Marketing by Segment
      Mild Surfactant Position

APPENDIX
### Table | AMERICAS - MAJOR BETaine PROducers AND CAPACITIES, 2017 (tons)

<table>
<thead>
<tr>
<th>Producer</th>
<th>Location</th>
<th>Trade Name</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td><strong>TOTAL</strong></td>
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</tbody>
</table>

### Table | EUROPE - ETHER CARBOXYLATE PRODUCTION AND MARKET SHARE, 2017

<table>
<thead>
<tr>
<th>Producer</th>
<th>Location</th>
<th>Volume</th>
<th>Market Share (percent)</th>
</tr>
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<tbody>
<tr>
<td></td>
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<tr>
<td><strong>TOTAL</strong></td>
<td></td>
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### Table | COMMERCiALLY AVAiLABLE SARCOSiNATES

<table>
<thead>
<tr>
<th>Product</th>
<th>Active Ingredient</th>
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<tbody>
<tr>
<td>Oleoyl sarcosine</td>
<td>94% min</td>
</tr>
<tr>
<td>Stearoyl sarcosine</td>
<td>94% min</td>
</tr>
<tr>
<td>Lauroyl sarcosine</td>
<td>94% min</td>
</tr>
<tr>
<td>Sodium lauroyl sarcosinate</td>
<td>29 - 31%, 94%, 95%</td>
</tr>
<tr>
<td>Sodium myristoyl sarcosinate</td>
<td>29 - 31%</td>
</tr>
<tr>
<td>Sodium cocooyl sarcosinate</td>
<td>29 - 31%</td>
</tr>
<tr>
<td>Cocoyl sarcosine</td>
<td>94% min</td>
</tr>
<tr>
<td>Myristoyl sarcosine</td>
<td>94% min</td>
</tr>
</tbody>
</table>
Table | ASIA - SULFOSUCCINATE CUSTOMERS BY END USE, 2017

<table>
<thead>
<tr>
<th>Market</th>
<th>Major Customers</th>
<th>Country</th>
</tr>
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<tbody>
<tr>
<td>Emulsion Polymerization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Textile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mining</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paints and Coatings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shampoo/Conditioner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bath and Shower Products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquid and Bar Soaps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
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</tbody>
</table>

Table | COMMERCIAL BETAINES

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Active Matter</th>
<th>Chemical Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50%</td>
<td>Cocoamidopropyl hydroxysultaine</td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td>Laurylamidopropyl betaine</td>
</tr>
<tr>
<td></td>
<td>31.1%</td>
<td>Hydrogenated cocoamidopropyl betaine</td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td>Lauryl betaine</td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td>Cocoamidopropyl betaine</td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td>Cocoamidopropyl betaine</td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td>Cocoamidopropyl betaine</td>
</tr>
</tbody>
</table>

Table | AMERICAS - SARCOSINATE CONSUMPTION BY END USE, 2017

<table>
<thead>
<tr>
<th>End Use</th>
<th>Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toiletries</td>
<td></td>
</tr>
<tr>
<td>· Toothpaste</td>
<td></td>
</tr>
<tr>
<td>· Shampoo</td>
<td></td>
</tr>
<tr>
<td>· Liquid Soap</td>
<td></td>
</tr>
<tr>
<td>· Syndet bars</td>
<td></td>
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<tr>
<td>· Shaving aerosols</td>
<td></td>
</tr>
<tr>
<td>· Other</td>
<td></td>
</tr>
<tr>
<td>Cleaning · Hypochlorite bleach thickening and carpet shampoos</td>
<td></td>
</tr>
<tr>
<td>Motor oil/transmission fluids</td>
<td></td>
</tr>
<tr>
<td>Antistats for polymers/fibers spinning</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
</tr>
</tbody>
</table>
QUALIFICATIONS AND PERSONNEL

Colin A. Houston & Associates, Inc. was founded in 1971 to provide consulting services to the chemical industry worldwide. The primary area of expertise is surfactants: raw materials, intermediates, major surfactants, and the surfactant consuming industries. Other areas of activity include: a variety of industry studies on such topics as oilfield chemicals, detergent builders, ingredients for personal care products, and bleaching agents; engineering studies such as a worldwide study of glycerine evaporation plants with recommendations for improved efficiency; process economics of world alpha-olefin plants; benchmarking of process economics for U.S. fatty acid producers; a world study of the state of the art in spray-drying detergents; contracts with the U.S. Government to develop industry effluent guidelines; and business strategy and acquisition studies.

The reputation thus earned by CAHA for comprehensive, high quality technoeconomic and market analyses has led to a variety of engineering, marketing, and strategic planning studies for individual clients in North and South America, Europe, Asia, Africa and the Middle East.

CAHA has completed similar editions with OPPORTUNITIES IN PERFORMANCE SURFACTANTS IN THE U.S. and OPPORTUNITIES IN PERFORMANCE SURFACTANTS IN WEST EUROPE. CAHA issues a quarterly newsletter SURFACTANT DEVELOPMENTS, which tracks news and issues for surfactants globally.

The project team approach utilized by CAHA includes a core of senior and technical professionals augmented by expert consultant associates. The following synopses present the staff and consultants who will contribute to the study.

Joel H. Houston, President, was the project leader on PRIMARY SURFACTANT OPPORTUNITIES - REGIONAL MARKETS TO 2025 and numerous other multiclient studies including, HIGHER ALCOHOLS TO 2025 NORMAL PARAFFINS - WORLD MARKETS, 2007-2017, OPPORTUNITIES IN PERFORMANCE SURFACTANTS IN WEST EUROPE, SURFACTANTS FOR EMERGING MARKETS IN ASIA/PACIFIC, 1996-2010, and SURFACTANTS FOR CONSUMER PRODUCTS - NORTH AMERICAN FORECAST TO 2008. Mr. Houston has extensive experience in projects for consumer products, has presented papers at CESIO, AOCS, BACS, ECMRA and IESD meetings, and is the editor of CAHA’s global newsletters, LAB MARKET REPORT and SURFACTANT DEVELOPMENTS. He is a member of PDMA, AOCS and ASTM. Mr. Houston holds a B.A. from Trinity College, Hartford, Connecticut and an M.A. from the Royal College of Art, London.

John Rapko, Senior Research Associate, has authored the Environmental Developments section of PRIMARY SURFACTANT OPPORTUNITIES - REGIONAL MARKETS TO 2025, Higher Alcohols Technologies section of HIGHER ALCOHOLS TO 2025, and authored sections of DETERGENT ALKYLATES - WORLD MARKETS, 2006-2016. Dr. Rapko contributes to CAHA’s LAB MARKET REPORT, and has also assisted on numerous proprietary studies. In Dr. Rapko’s 36 years of professional experience, he has directed the work of professional chemists and chemical engineers at all degree levels in the areas of process development, chemistry, engineering and assessment of a range of technologies related to areas such as the manufacture of detergent alkylate, detergent builders and dehydrogenation catalysts. He holds a Ph.D. and B.S. in Chemistry (ACS Certified) from St. Louis University. He is a member of the American Chemical Society, American Oil Chemists Society, an Associate Editor for the Journal of Surfactants and Detergents and a member of Sigma Xi, the Scientific Research Society.
Ken Schoene, Senior Research Associate, is a chemical industry executive with a strong technical background. He has consulted for CAHA on many projects. Before his retirement from industry, Mr. Schoene worked for three major multinational companies: BASF, Sandoz Colors & Chemicals (now Clariant) and Unilever in business and technical positions. At BASF, he held the post of NAFTA Director, Alkylene Oxides/Glycols GBU, with a previous post of Director of Performance Chemicals. While at Sandoz, he was Business & Technical Director for Specialty Chemicals. Mr. Schoene has three U.S. patents, various trade publications and has given many presentations at industry meetings. He is a member of American Oil Chemists Society (Surfactant & Detergent Div.), Racemics (Purchasing & Sales Organization). He holds a B.S. in Chemistry from Fairleigh Dickinson University in New Jersey.

Dr. Guido Bognolo, Senior Research Associate, authored several sections of OPPORTUNITIES IN PERFORMANCE SURFACTANTS IN WEST EUROPE and has consulted in the field of surfactants, fine chemicals and product/business development. He is a European contributor for CAHA’s annual surfactants review and has authored over 40 articles on surface active agent products and applications. Prior to working with CAHA he held the post of worldwide product manager of alkylene oxide surfactants and derivatives at Uniqema, Brussels and as Director of Innovation prior to that. He previously spent over 20 years with ICI in various positions including Business Development, Business Manager Industrial Surfactants. Prior to ICI, Dr. Bognolo worked for Procter & Gamble European Technical Center in Brussels formulating household detergents and also Atlas Chemical Industries in Brussels in the product and formulation development area for personal care, crop protection, polymer additives and general industrial applications. Dr. Bognolo is a member of Belgium Senior Consultants and holds a degree in Theoretical Chemistry from the University of Trieste, Italy.

Masaki Tsumadori, Senior Research Associate, is an expert in the Fabric and Home Care field, having 40 years of experience with Kao Corporation, currently as Senior Advisor, R&D. He has served in a consulting capacity and assisted on PRIMARY SURFACTANT OPPORTUNITIES – REGIONAL MARKETS TO 2025. Mr. Tsumadori began his career for Kao Corporation in Tokyo, Japan. He subsequently held senior positions in and across R&D, and played key roles in the development and launch of powder and liquid laundry detergents in Japan and throughout Asia. Prior to his retirement he became a Research Fellow of the Strategy Research and Director of the Kao Eco-Lab Museum. Mr. Tsumadori is a member of the Governing Board of American Oil Chemists’ Society (AOCS) and the International Society for Fat Research (ISF); Program Committee of the European Committee of Organic Surfactants and their Intermediates (CESIO); Board of Directors of Japan Oil Chemists’ Society (JOCS) and the Japan Research Association for Textile End-Uses (JRATEU). Mr. Tsumadori holds a Masters Degree in Polymer Chemistry from Nagoya Institute of Technology.

Donald M. Faison, Research Associate, is an expert in market research and statistical analysis of data with over 20 years experience in actinide chemistry and non-destructive analysis of gamma-rays and neutrons in several different laboratories. He was a contributing author to PRIMARY SURFACTANT OPPORTUNITIES – REGIONAL MARKETS TO 2025, DETERGENT ALKYLATES – WORLD MARKETS TO 2025, and HIGHER ALCOHOLS TO 2025. Since joining CAHA in 2012, he has contributed to several proprietary studies including: APE REPLACEMENTS IN THE U.S. Mr. Faison was a chemist, radiochemist, and senior scientist at several nuclear facilities. As a chemical engineer, he was responsible for dissolution of actinide metals and oxides, and anion resin exchange processes. He is a member of the American Oil Chemists Society and holds a B.S. in Chemical Engineering, Clemson University (ABET accredited) and a B.S. in Chemistry, Furman University.
HOW TO SUBSCRIBE

To subscribe to the study, please complete and sign the contract and mail or fax to the address below. On receipt, we will countersign it and return a photocopy to you for your files along with our invoice for the first half payment.

Colin A. Houston & Associates, Inc.
262 Eastgate Drive 323
Aiken, SC 29803 USA
Telephone No.: +1 803-226-0350
E-Mail: CAHA_Research@colinhouston.com
Website: www.colin-houston.com
LIST OF MULTI-CLIENT STUDIES

PRIMARY SURFACTANT OPPORTUNITIES - REGIONAL MARKETS TO 2025 (November 2016) provides a thorough analysis of the strategic developments, market trends, new technology, and threats and opportunities that are reshaping the primary surfactant industry. It identifies and examines a range of topics and issues that will impact the industry in the years to come. Global and regional primary surfactant markets are analyzed to provide a comprehensive view of the uses, market size and participants by region, with a forecast to 2025. Some 22 companies are profiled and a complete listing of ethoxylators and sulfator/sulfonators are included.

DETERGENT ALKYLATES - WORLD MARKETS TO 2025 (July 2015) is a comprehensive study which details the production, capacity, trade and supply/demand balance by region for LAB. Major factors affecting the outlook are examined including raw material requirements, surfactant consumption trends, novel technological developments, production costs, prices, sulfonation capacity, and environmental issues, among others. Historical and forecast consumption of LABS is reviewed in depth for the 2005-2025 period by application and end use, incorporating an understanding of the formulation trends, competition with alcohol-based surfactants, consumer preferences and customer-oriented requirements.

HIGHER ALCOHOLS TO 2025 (February 2013) analyzes the scale and potential effect of the rapid buildup of new fatty alcohol capacity in Southeast Asia. The study includes synthetic and oleo-derived fatty alcohols production economics, technology and market forecasts. Twenty-two in-depth alcohol producer profiles are included. Surfactant trends and markets are covered for the major alcohol derivatives.

NORMAL PARAFFINS - WORLD MARKETS, 2007-2017 (February 2009) explores the scale of a looming shortage and determines the potential impact of gas-to-liquid n-paraffin capacity to come on-stream in 2011. This study covers the supply of normal paraffins, producers and their operations, capacities, integration, historical and forecast production by region. It also covers the demand for normal paraffins, including consumption by region and by end use, market trends and issues, and future supply/demand balances.

OPPORTUNITIES IN PERFORMANCE SURFACTANTS IN WEST EUROPE (January 2007) provides an in-depth analysis on each of ten specialty materials. Topics include product performance and differentiation, costs, consumption and trends, competing materials and systems, and major customers as well as producers, including their production and market share. Thirteen producers are profiled, giving an added perspective on their overall position in the specialty surfactants market.

ALPHA-OLEFIN MARKET INTELLIGENCE DATABASE (September 2001) analyzes all the factors affecting alpha-olefin supply and demand. It assesses the impact of new plants and potential new producers and quantifies production and consumption by chain length and by region. It provides detailed data on over 20 individual end use markets including producers, production, market trends and alpha-olefin consumption.
LIST OF NEWSLETTERS

LAB MARKET REPORT is designed to bring together, in one concise monthly publication, all the news of interest to LAB market participants. CAHA has published this report since 2001. It offers current information on the entire LAB value chain from raw materials to detergents and other end uses. There are a range of relevant feature articles included. Each one offers a timely and concise review of the subject without entering into excruciating historical content but, nevertheless, providing sufficient content and coverage so that our readership walks away with a complete picture. The annually updated LAB DATABASE, included with the subscription, contains the complete list of detergent alkylate producers and capacities by region, the LAB trade balance and LAB price history. A one-year subscription (January-December) to the LAB MARKET REPORT AND DATABASE includes 12 monthly issues. Delivery of the newsletter is via Internet access.

SURFACTANT DEVELOPMENTS NEWSLETTER keeps surfactant producers informed of key news and developments occurring in their market in a form that is both concise and thorough. It is designed to help subscribers make efficient use of their time while gaining useful knowledge of specific developments and enlarging their understanding of the major issues shaping the market. CAHA began publication of this newsletter in 2003 as an extension of the multiclient SURFACTANT DEVELOPMENTS - FORECAST TO 2010. A one-year subscription (January-December) includes four quarterly issues. Delivery of the newsletter is via Internet access.
AMONG CAHA’S CLIENTS ARE:

Abengoa
Air Products and Chemicals, Inc.
AkzoNobel
Albemarle Corp.
Amway
Aradet
Ardor
Ashland Chemical
Avon Products, Inc.
BASF
Bayer AG
Bliss Chemical
Borax
Calgon Corp.
Cargill, Inc.
CasChem
CECA
Central Soya
CEPSA
Chemithon
Chemtura
Chevron Corp.
Chevron Phillips Chemical
Clariant International Ltd.
Clorox Co.
Colgate-Palmolive
Cytec Industries Inc.
Daelim Industrial Co., Ltd.
Deten Química S.A.
Dow Chemical
DSM
Dyno Industries
Eastman Chemical Products
Ecogreen Oleochemicals
Ecocolab
E.I. duPont de Nemours & Co
Elevance Renewable Sciences
Emery Oleochemicals
Ethyl Corp.
Evonik
ExxonMobil Chemical Co.
Farabi Petrochemical Co.
Fluor
FMC Corp.
Fogla Group
Galaxy Surfactants
Genencor
Givaudan
Haarman & Reimer Corp.
Henkel
Honeywell International - UOP
Huntsman Corp.
Idemitsu Petrochemical Co. Ltd.
IMC Corp.
Indian Oil Corp.
INEOS
Inolex Corp.
ISU Chemical
JX Nippon Oil and Energy Corp.
Kao Corp.
 Kemira Oy
KLK Oleo
Lam Soon Oil & Soap Mfg.
LaPorte Industries PLC
Lion Corp.
Lonza Inc.
 Lubrizol Corp.
Lyondell Chemicals
Millenium Chemical Corp.
Mitsubishi Chemical
Mitsui & Co.
Muntajat
Musim Mas/ICOF
Nafto Chemical
Neste Oy
Nova Chemical
Novozymes A/S
Occidental Petroleum/Oxychem
OLEON N.V.
ONIDOL
Oxeno
Oxiteno
Penoles
Persan
Pilot Chemical Company
PQ Corp.
Procter & Gamble
PZ Cussons
Qatar Petroleum
Reckitt Benckiser
Reliance Industries
Ruetgers Corp.
SABIC
Sasol
S.C. Johnson & Son
SEEF Ltd.
Shell Chemical LP
SI Group
Solvay S.A.
Spolana
Stepan Company
Sterling Chemicals, Inc.
Sumitomo
Sunoco
Tamilnadu Petroproducts Ltd.
Tasweeq
Tetra Technologies
Thai Ethoxylates - PTT
TotalFinaElf
Toyota Tsusho
Tufail Chemicals
Unger Fabrikker A.S.
Unilever
Uniqema
United Coconut Chemicals, Inc.
Unocal
Varela
Venoco
Vertellus Specialties, Inc.
Vulcan Chemical
Warwick International Ltd.
WeylChem
Wilmar International
W.R. Grace & Co.
YPF