Colin A. Houston and Associates, Inc.
announces a new study entitled

HIGHER ALCOHOLS: MARKET FORECAST TO 2010

Global demand for higher alcohols (C_{12+}) will grow at an annual rate of 3.1 percent, from 1.5 million tons in 1998 to 2.1 million tons in 2010. Three major surfactants - alcohol ethoxylates, alcohol ether sulfates and alcohol sulfates - account for 75 percent of higher alcohol consumption, estimated at 1.6 million tons in 2000. These are some of the findings of CAHA's new multiclient study, *HIGHER ALCOHOLS: MARKET FORECAST TO 2010*.

The new alcohol study includes a detailed global analysis of surfactant consumption and reports that worldwide demand has grown 3 percent per year since 1992. The global study details alcohol demand in the major end use segments - Household, Personal Care, Industrial and Institutional, and Industrial Processing Aids by region over the 1992-2010 period. Also included are sections evaluating raw materials, technology, supply, competing materials and environmental issues.

The study evaluates manufacturing economics of the various routes to alcohols and finds a compelling story for the advantages to be gained by large scale production. Certainly the lack of scale has been problematic for the smaller oleo alcohol producers who have also suffered from feedstock costs in the last few years. By-products, including glycerine and short chain materials, are especially important for the competitive economics of the alcohol producers. Competition will continue to be cost performance driven within a very broad market in terms of the product types offered.

This comprehensive study was completed in May 2000 and is available for immediate delivery. The following pages contain the table of contents and other details. Please contact us at the address on the back cover if you have any questions.

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DESCRIPTION OF THE STUDY

Higher alcohols are a complex field with a range of products served by competing economics which are often dependent on diverse by-product credits. Furthermore, markets are frequently complicated by the preferences for different types and cuts of alcohol products. Other key factors include the degree of integration of the producers. Two of the largest oleo alcohol producers are forward integrated into consumer products while many of the synthetic alcohol producers are integrated with feedstocks and surfactants.

The market analysis embodies regional trends and developments in formulation by end use in each of the regions and addresses the future impact on higher alcohol consumption over the 2000-2010 period. Issues related to raw material costs, regional consumer preference (e.g., powder vs liquid detergents), consumer health conscious-ness and trends toward milder detergents, and environmental concerns over biodegrability of LABS and APE are among the factors evaluated and impacting current and future alcohol demand. While North America and West Europe will remain the largest markets for higher alcohol, more rapid growth for alcohol demand over the next 10 years will occur in Asia and Other regions.

CAHA's in-depth analysis of this increasingly important market is offered as an 800-page report organized into nine chapters. A brief discussion of the main ones follows.

Raw Materials

The competing feedstocks are reviewed and their supply outlooks are profiled. The lauric oils, coconut and palm kernel, are competing feedstocks for oleo alcohol. The long term supply of coconut has been stagnating while the supplies of palm kernel, a by-product of palm oil manufacture have seen rapid growth. Feedstocks for the petrochemical alcohol routes, such as ethylene and normal paraffin are also reviewed. The pricing situations of the raw materials, which are entering a new dynamic period, are explored and compared.

Higher Alcohols Technology

A range of manufacturers' processes are currently employed for higher alcohol production. These routes are detailed and costs are estimated for both whole cut and mid-cut alcohol products. The implications for the processes are evaluated on a comparable basis; the takeaway is an understanding of the relative merits of the various processes, and also the kind of cost variation that can take place as a result of changing feed and by-product values. Regional prices histories are presented.

Higher Alcohols Supply

A detailed review of production by type of alcohol and by producer is supported by descriptions of producers and their plants. Another feature of this chapter is the analysis of the captive use and merchant sales by producer in the three main regions.

Higher Alcohols Demand

Demand by region and by direct and derivative end use is presented in alcohol terms. Chain length issues related to demand are also reviewed.

Higher Alcohol End Uses

A detailed analysis of demand for the major alcohol-based surfactants, e.g., alcohol ether sulfates, and lesser known markets such as methacrylate esters and direct uses for alcohols is presented. The major surfactants account for three quarters of all alcohol usage and these segments are detailed by application area. The derivative producers and alcohol customers are described by region. The chapter also includes tables showing plant locations and capacities of ethoxylators and sulf(on)ators by region for 1999.

Surfactant End Markets

A surfactant survey provides an understanding of global surfactant markets, discussing formulation issues and other developments affecting alcohol derivatives and competing materials by subsegment and by major country. The historical development and future outlook for these markets is described and surfactant demand by type, by end market and by region is detailed for the period 1992 through 2010.

Environmental Issues

The safety of alcohol-based surfactants and other materials is reviewed in this chapter that focuses on biodegradability and toxicity. Legislative efforts and testing results and methods are explained along with other less prominent issues.

End Use Competition and Conclusions

This chapter first discusses global factors of intercompetition among surfactant intermediates, including raw materials, producer integration, and pricing. It then addresses cost performance, environmental and other points of competition between alcohol-based surfactants, linear alkylbenzene sulfonates and other key materials.

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Table 5

WORLD - DETERGENT-RANGE ALCOHOL (C_{12+}) PRODUCTION BY REGION, 1992-2010
(thousand tons)

Region	1992	1998	1999	2000	2002	2005	2010	AAGR % 1998-2010
North America								
West Europe								
Asia								
Other Regions								
TOTAL								

Table IV-4

NORTH AMERICA - DETERGENT-RANGE ALCOHOL (C_{12+}) PRODUCTION BY TYPE, 1992-2010
(thousand tons)

Type	1992	1998	1999	2000	2002	2005	2010	AAGR % 1998-2010
Synthetic alcohol								
Oleo alcohol								
TOTAL								

Table IV-6

WEST EUROPE - DETERGENT-RANGE ALCOHOL (C_{12+}) PRODUCTION BY PRODUCER, 1992-2000
(thousand tons)

Producer	Location	1992	1998	1999	2000F
OLEO ALCOHOLS					
TOTAL OLEO					
SYNTHETIC ALCOHOLS					
GRAND TOTAL WEST EUROPE					

F = Forecast

Table V-5

WEST EUROPE - HIGHER ALCOHOL DEMAND FORECAST, 1992-2010
(thousand tons)

	1992	1998	2000	2005	2010	AAGR % 1998-2010
Alcohol ethoxylates						
Alcohol ether sulfates						
Alcohol sulfates						
Subtotal						
Nitrogen Derivatives						
Quaternary ammonium compounds						
Amine oxide						
Other ADA derivatives						
Subtotal Nitrogen Derivatives						
Other Intermediates						
Alkylpolyglycosides						
Methacrylate esters						
Sulfosuccinates						
Others						
Subtotal Others						
Direct End Uses						
Personal care						
Other						
Unspecified other						
TOTAL						

Table VI-12

WORLD - ALCOHOL ETHOXYLATE CONSUMPTION BY END USE, 1992-2010
(thousand tons, 100 percent solids)

	1992	1998	2000	2005	2010	AAGR % 1998-2010
Household						
Personal Care						
Industrial & Institutional						
Industrial						
TOTAL[a]						

[a] Does not include AE consumed in AES production.

Table VI-52

ASIA - ALCOHOL SULFATE CONSUMPTION BY END USE, 1992-2010
(thousand tons, 100 percent solids)

	1992	1998	2000	2005	2010	AAGR % 1998-2010
Household						
Personal Care						
Industrial & Institutional						
Industrial						
TOTAL						

Table VII-1

WORLD - TOTAL SURFACTANT CONSUMPTION BY END USE, 1992-2010
(thousand tons)

	1992	1998	2000	2005	2010	AAGR % 1998-2010
HOUSEHOLD						
North America						
West Europe						
Asia						
Other Regions						
TOTAL						
PERSONAL CARE						
North America						
West Europe						
Asia						
Other Regions						
TOTAL						
I&I CLEANERS						
North America						
West Europe						
Asia						
Other Regions[a]						
TOTAL						
INDUSTRIAL PROCESS AIDS						
North America						
West Europe						
Asia						
Other Regions[a]						
TOTAL						
GRAND TOTAL[b]						

[a] Incomplete data for I&I and Industrial Process Aids.
[b] Does not include soap.

Table VII-72

WEST EUROPE - SURFACTANT CONSUMPTION IN LIGHT DUTY LIQUIDS BY COUNTRY - 1998
(thousand tons)

Country	AE	AES	AS	LABS	Other	Total
France						
Germany						
Italy						
Spain						
U.K.						
Other						
TOTAL[a]						

[a] Does not include soap

Table VII-139

ASIA - SURFACTANT CONSUMPTION IN I&I CLEANERS BY END USE, 1992-2010
(thousand tons)

End Use	1992	1998	2000	2005	2010	AAGR % 1992-2010
Laundry						
Hard surface						
Dishwashing						
TOTAL[a]						

[a] Does not include soap.

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 was and continues to be 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 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; 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 techno-economic and market analyses has led to a variety of engineering, marketing, and strategic planning studies for individual clients in North America, Western Europe, and the Far East.

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 carried out the study, HIGHER ALCOHOLS: MARKET FORECAST TO 2010.

Joel H. Houston, President,

was the project leader for numerous multiclient studies including HIGHER ALCOHOLS: MARKET FORECAST TO 2010, SURFACTANTS FOR EMERGING MARKETS IN ASIA/PACIFIC, 1996-2010, OPPORTUNITIES IN PERFORMANCE SURFACTANTS IN THE U.S., SURFACTANTS FOR CONSUMER PRODUCTS - NORTH AMERICAN FORECAST TO 2008, and DETERGENT ALKYLATE - WORLD MARKETS, 1992-2005. He has guided CAHA's research in oleochemicals since 1980, and in detergents since 1987. Mr. Houston has extensive experience in projects for consumer products, has presented papers at CMRA, ECMRA and CSMA meetings, and is the editor of CAHA's global detergent newsletter, AGGLOMERATIONS. He is a member of CDMA, AOCS and ASTM.

Marilyn L. Bradshaw, Vice President,

was the project leader for INDUSTRIAL APPLICATIONS OF SURFACTANTS - NORTH AMERICAN FORECAST TO 2010, POLYOLEFIN COMONOMERS - WORLD MARKETS, 1995-2005 and ALPHA-OLEFINS - WORLD MARKETS, 1990-2002. Other recent multiclient studies she has directed include THE U.S. METALWORKING INDUSTRY AND SURFACTANT CONSUMPTION, 1995-2005, and U.S. I&I CLEANING PRODUCTS - SURFACTANT SUPPLIERS AND CUSTOMERS. She is the editor of CAHA's monthly alpha-olefin newsletter and provides consultation to clients on alpha-olefins. Since joining CAHA in 1980, she has also been the project leader for numerous proprietary projects such as an analysis of the growth prospects for 22 U.S. surfactant ethoxylators. Ms. Bradshaw has a B.A. from Finch College and an economics and management certificate from Manhattanville College. She is an active member of CDMA.

Dr. Darrel L. Muck, Senior Research Associate,
authored our multiclient studies GLUCOSAMIDES: THE CHALLENGE OF A NEW SUGAR-BASED SURFACTANT, 1993-1998 and DEVELOPMENTS IN DETERGENT BUILDER SYSTEMS - NORTH AMERICAN REPORT TO 2005. He has also contributed sections of CAHA's study INDUSTRIAL APPLICATIONS OF SURFACTANTS - NORTH AMERICAN FORECAST TO 2010, SURFACT-ANTS FOR EMERGING MARKETS IN ASIA/PACIFIC, 1995-2010, SURFACT-ANTS FOR CONSUMER PRODUCTS - NORTH AMERICAN FORECAST TO 2008, OPPORTUNITIES IN PERFORMANCE SURFACTANTS IN THE U.S. and was responsible for the Paint end use chapter of MAJOR INDUSTRIAL APPLI-CATIONS OF SURFACTANTS - NORTH AMERICAN FORECAST TO 2005. Dr. Muck has 30 years experience in the chemical industry and was most recently Director of Commercial Development, FMC Chemicals Division. He holds B.S./ M.S. degrees in chemistry from Wichita State University and a Ph.D. in Organic Chemistry from the University of Florida. He is a member of ACS and AOCS.

H. James Bigalow, Senior Research Associate,
authored the Paper and Textiles end use sections of our multiclient studies INDUSTRIAL APPLICATIONS OF SURFACTANTS - NORTH AMERICAN FORECAST TO 2010 and SURFACTANTS FOR EMERGING MARKETS IN ASIA/PACIFIC, 1995-2010, contributed to SURFACTANTS FOR CONSUMER PRODUCTS - NORTH AMERICAN FORECAST TO 2008 and has worked on proprietary detergent and surfactant studies. Mr. Bigalow has over 20 years experience as a senior marketing research executive in the chemical industry. He has conducted successful business analysis projects which have included financial evaluations of businesses and acquisition candidates, identifying current and future markets for new and existing products, and product development and usage. Additional experience has included economic and sales forecasting, strategic planning, proprietary market research projects, benchmarking, and product safety. He is a member of the CDMA, the Society of Competitive Intelligence Professionals (SCIP), ACS and the Chemical Marketing and Economics Division of the ACS. Mr. Bigalow holds an M.S. Industrial Administration, Krannert School of Management, Purdue University and a B.S. degree in Chemistry, Denison University.

Max M. Negrin, ***Project Director***,
recently joined CAHA and has authored a section of a proprietary study on a new bleach catalyst and conducted a study of the market potential for a new bio-flavor. Mr. Negrin has over 12 years of experience in the chemical industry spanning basic

R&D, product development, sales and marketing, chemical trading and chemical business consulting. Product and market areas have included polymers and coatings, adhesives and sealants, plating and electronic chemicals, polyacrylates, polyethylene, styrene block copolymers and fluoropolymers. Mr. Negrin has published four patents among which are patents on unique water soluble systems. He holds a B.A. in Chemistry and an M.S. in Physical Chemistry from New York University.

Jenny Qin Li, Research Associate

authored the Ag Chem and other sections of our multiclient studies INDUSTRIAL APPLICATIONS OF SURFACTANTS - NORTH AMERICAN FORECAST TO 2010 and SURFACTANTS FOR EMERGING MARKETS IN ASIA/PACIFIC, 1995-2010, the Personal Care section of SURFACTANTS FOR CONSUMER PRODUCTS - NORTH AMERICAN FORECAST TO 2008 and the Betaines, Sarcosinates and Amine Oxide sections of OPPORTUNITIES IN PERFORM-ANCE SURFACTANTS IN THE U.S. She holds a B.S., Industrial Foreign Trade and Computer Science, Shanghai University of Technology, Shanghai, China and has a Masters degree in Business Administration, Clark University, Worcester, MA.

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To subscribe, please contact us:

Colin A. Houston & Associates, Inc.
69 Westchester Ave.
P.O. Box 427
Pound Ridge, NY 10576 U.S.A.
Telephone No.: (914) 764-1022
Fax No.: (914) 764-1067
E-Mail: CAHA1@colinhouston.com
Website: www.colin-houston.com