

**PLAINTIFF'S
EXHIBIT**

CBL-245

CELANESE CHEMICAL COMPANY
Chemcel Plant
Bishop, Texas

To: C. W. Harrison

From: W. H. Meyer

WHM-108-77

December 12, 1977

Laboratory Department Summary
November, 1977

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CELANESE CHEMICAL COMPANY
Chemcel Plant
Bishop, Texas

To: C. W. Harrison

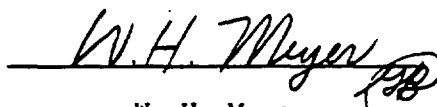
From: W. H. Meyer

WHM-108-77

December 12, 1977

Laboratory Department Summary
November, 1977

The Bishop Plant Laboratory activities during November are attached. Section I contains a summary of the Analytical Group activities with a table of analytical statistics. Section II contains a Quality Assurance Summary and a table listing shipments, quality waivers, quality complaints and sample shipping statistics. Section III describes the status of Special Problems Group projects by Unit Chemist assignment. A table listing the priorities, justifications and estimated completion dates of current Special Problems projects is also included in Section III.


W. H. Meyer

WHM/jm
Attached Report

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I. ANALYTICAL GROUPCompetitive Evaluation

None this month.

General

The storage stability tests on methylal in carbon steel under Korrid-treated and untreated conditions have been completed. A report will be issued by J. H. Harris.

The storage stability tests of n-butyraldehyde in aluminum have been completed. A report is being prepared. Further studies of n-butyraldehyde in carbon steel with Plasite 4005, Plasite 3066 and Heresite P-403 treatment are underway.

Routine tests were run on four cooling water samples from the Celanese Plant in Valencia, Venezuela, in support of an effort to resolve their cooling water treatment problems. The results were reported to R. H. Scott at CCCTC.

Analytical StatisticsSample Count

	<u>November</u>	<u>November Y-T-D</u>	<u>Previous Y-T-D</u>
Chemical Section	4,793	54,279	49,855
Instrument Section	<u>2,613</u>	<u>26,383</u>	<u>23,659</u>
Total	7,406	80,662	73,514

Technician Overtime (hours)

Chemical	89	764	674
Instrument	<u>62</u>	<u>685</u>	<u>565</u>
Total	151	1,449	1,239

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II. QUALITY ASSURANCE

There were no quality complaints during November. One shipment of propyl acetate to Celriver was delayed for 3 days due to butyl acetate content above 0.1%.

Trimethylolpropane (TMP) - The unit operation had two periods in November when the purity of the TMP was borderline (98.0%), or slightly below. The overall range has been 98.0 - 98.7%. Operating parameters used in the past have not been successful in increasing the purity to 99.0%.

Isobutyraldehyde - The propylene content in the isobutyraldehyde product is ranging from 3.0 - 5.0% on tank car and truck loadings. (The normal range is 1.0 - 3.0%.) This abnormal level of propylene is probably due to cooler temperatures, and as a result, the purity is consistently below 94.0% isobutyraldehyde. Feedback from Bay City reports that by the time they get the product unloaded into their storage, the propylene has weathered off and purity is above 94.0%.

Pentaerythritol (PE) Tech - At the beginning of November, a one-pound sample of Korean PE Tech and Pure was requested for competitive product evaluation. These samples have not been received as of this date.

Methyl Formcel® Product - There was only one car shipped to American Cyanamid during the month of November. As of this date, we have not received a sample of the Borden-Methaform "A". This sample was requested of Field Sales in September by D. J. Foley.

Quality problems during the month were minor. A color problem (10 color) developed in mid-November for several days. No assignable cause was noted.

Methylal - Merck Chemical Company, Inc. returned a sample of methylal to the Chemcel Laboratory for evaluation. This sample represented material shipped to them in drums from the South Coast Terminal. Merck reported the methanol content to be 3.0%. The last shipment of methylal to South Coast Terminal from which they loaded drums had a methanol content of 0.85%. Our retain analyzed 1.06% methanol, and the sample returned to us from Merck had 1.61% methanol.

Propylene - Amoco reported they were uncertain about the results for halide on nine cars of propylene. They reported halides at less than 1ppm, but were having analytical instrument problems. Upon receipt at Chemcel, the cars were analyzed and found to be acceptable.

Formaldehyde (HCHO) - The Metolose stabilizer addition to finished and blended HCHO is still erratic. During mid-November the level was below 1ppm for 3 days. The ideal level is from 8 - 12ppm to maintain a stable product in the market. Methods of addition and new analytical procedures are being evaluated.

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Miscellaneous - A report has been written covering the evaluation of 1,3-butylene glycol samples sent to our Laboratory from Warner-Lambert. These samples represented drums of 1,3-butylene glycol sent to the customer from the Newark Terminal.

A report has been issued covering an evaluation of polymer-like material from trioxane shipped from Amcel Europe to a customer in England. The original analysis and the retain analysis confirm that we shipped a product free of polymer.

November 3, 1977, J. C. Trebellas requested the Chemcel Laboratory evaluate a sample being sent from the Wilmington, Delaware, sales district. The methanol sample was reported to contain 2% of unknown esters. As of this date, the sample has not been received.

A sample of n-Butyl Formcel[®] product sent to the Chemcel Laboratory from Steetly Chemical Company (Australia) has been analyzed. The sample analysis shows the iron to be 1.5ppm (spec = 0.5ppm), and the material appears cloudy. The product would not clear on heating. A letter will be issued.

Note: See attached Sample Shipping and Quality Assurance Statistics, and Quality Waivers and Shipments Delayed Due to Quality.

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Sample Shipping and Quality Assurance StatisticsSample Shipping

	<u>November</u>	<u>November Y-T-D</u>	<u>Previous Y-T-D</u>
Domestic	69	961	1,127
Export	5	87	126
Plastics	4	74	111
Other	<u>12</u>	<u>734</u>	<u>272</u>
Total	90	1,856	1,684
Shipments (# of Orders)	799	9,326	8,707
Delayed due to Quality	1	26	33
Quality Waivers	0	39	12
Quality Complaints	0	49	25
Quality Complaints Accepted	0	15	10

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Quality Waivers and Shipments Delayed Due to Quality

Date	-11-7-77
Product	-Propyl Acetate
Customer	-Celanese Chemical Company
Destination	-Celriver, South Carolina
Tank Car/Tank Trailer/Solids	-ACFX 81209
Delay or Waiver	-Delay
Comments	-n-Butyl Acetate content above 0.1%. Special Spec for Celriver. Shipped 11-10-77 with new production in Celx 2059.

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III. SPECIAL PROBLEMS

Methanol Oxidation, Formaldehyde Blending J. D. Presley

MO Efficiency Increase With Trace Amounts of Halogenated Hydrocarbons - Lab work has been temporarily discontinued due to priorities. Work is planned to resume early in 1978.

MO Catalyst Reuse - A status report is in progress. Work continues.

MS-II Crude to MO - Plant trial of MS-II crude to MO has been postponed until later in December. A sample schedule for the plant trial has been issued (JDP-08-77), and will apply to the new scheduling.

MO Catalyst Screening - A program is underway to establish the rate of catalyst contamination in the MO units.

Reduce Methylal Formation In the MO Distillation Columns - No progress due to priorities.

Nepera Blend - A report has been written describing all laboratory work, to date (JDP-07-77). A meeting with Nepera to discuss laboratory results is currently planned for January, 1978. No further lab work is planned unless requested.

MO Unit Support - MO-IV has continued to suffer efficiency losses this month. The apparent cause is iron contamination on the catalyst surfaces. Analysis of two reactors (<3 weeks service) showed 250 and 203ppm iron. Vent analyses also confirm the iron contamination showing high by-product formation of methane and dimethyl ether. The source of the contamination is undetermined. Work continues.

Hydrolysis of Methyl Formate in T-240 Overhead - Marvin E. Harris

Samples of T-240 overhead were analyzed for increases in acid concentration as a function of time. It was found that significant increases in acid concentration occurred after 8-10 hours at 43°C (109°F). A letter was issued (MEH-01-77) recommending that T-240 overhead not be stored in V-2497 and V-2498 and then fed to the MO-II absorber.

Stability of 50% and 52% Formaldehyde - Ms E. Harris

A study is underway to determine the methocel concentration in 50% and 52% formaldehyde (HCHO) shipments. A correlation to storage stability at 120°C will also be determined.

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Utilities, Raw Materials, BOD
S. G. Smith, G. R. Stasney

Purchase Specification Update - No progress due to priorities.

BOD Unit Analytical Methods Manual - No progress due to priorities.

Anaerobic Testing of Chemical Wastes - Construction of the Bishop Laboratory anaerobic-aerobic pilot unit continues. In the anaerobic section, work has been completed on (1) the feed and recycle system, (2) the temperature control system, and (3) the offgas vent. The tank and aerators for the aerobic section are being assembled. A clarifier tank has been obtained. Complete construction of the unit is expected by early January, 1978.

DAA Color Stability - A report of progress, to date, will be issued. No further work is planned.

BOD Unit Support - Laboratory monitoring of BOD operational controls predicted a minor upset of the unit due to COD overloading early in the month. A letter has been submitted discussing BOD upsets resulting from COD overloads. The letter also contains an updated instrument COD analytical method. Recommendations concerning COD loading to the BOD unit are also included.

800gpm Demineralizer Unit Support - Analytical support for blocking flow regeneration of the strong acid cation bed (V-2408) was provided by determining sodium leakages of the bed with and without blocking flow. Results of this study will be published sometime in December in a letter to be co-authored with Process Engineering.

Formaldehyde Blending

Unit Regeneration Study - This study is to determine if pH, conductivity, etc., can be used, on stream, to detect the exhaustion point of the blending unit ion exchange beds. Work is scheduled to begin in December.

OSHA Monitoring
J. M. Jackson, L. M. Pena

Results of asbestos sampling in the Plastics Company Celanex area have been received. A report is in progress.

Sample collection for personal 8-hour TWA exposure of Operator Helpers to benzene and methyl alcohol in Celcon TO-II and SH-II is complete.

Eight-hour TWA and peak benzene exposure samples are currently being taken on TO-II Operators and Operator Helpers in TO-I and SH-I. In addition, ethylene oxide data are being obtained. A report will be issued.

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Particulate dust samples are being obtained in the lime treatment warehouse. This follow-up data is being secured for documentation following engineering changes to the lime dump area. A report will be issued.

Evaluation and validation of the CEA 555 instrument for formaldehyde service has been completed by CCCTC. None of the major compounds found at the Bishop Plant showed interference. A letter will be issued by CCCTC.

At the Safety Department's request, spot samples for benzene were obtained around the benzene-trioxane tank 1661 in the Plastics Company tank farm. Results of these samples are detailed in GDB-10-77.

Esters, Methylal, Paraform, Formcels
R. G. Briell, R. G. Hilbrich

Paraform, Formcels and
Ester Unit Analytical Manual - No progress due to priorities.

Alternate n-Butyl Acetate Process - A reactor and reactor column was constructed in the Laboratory for evaluation of a proposed alternate n-butyl acetate process. Analytical methods necessary for the evaluation are presently being developed. Work continues.

Paraform Material Balance - Delayed, pending full-time Process Engineering coverage on the Paraform unit.

Ester Unit Air Emission Survey - Ester unit vents have been sampled during an isobutyl acetate run. The samples were entirely noncondensable. They were sent to the Tech Center for mass spec analysis. Future sampling of the same vents during n-butyl acetate and n-propyl acetate runs is scheduled. Upon completion, a letter will be issued jointly with Process Engineering.

Acetate Unit Support - The Laboratory is providing assistance to the Instrument Development group during the installation of the on-line gas chromatograph for the acetate reactor. Assistance has been in the form of determination and preparation of standards that are at the equilibrium concentration, and will not undergo further reaction. A back-up analysis to the on-line gas chromatograph is ready if necessary. Support continues.

1,3-Butylene Glycol, Diacetone Alcohol
A. R. Hancock

1,3-Butylene Glycol Unit Support - No Laboratory support needed.

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1,3-Butylene Glycol Cost Reduction - Data on replacing the vapor sidestream from the butylene glycol column (T-227) with a liquid sidestream or residue stream, is being reviewed. A joint letter with Process Engineering will be published during January regarding the future plans of the project.

1,3-Butylene Glycol (BG) and Diacetone Alcohol (DAA) Air Emissions Survey - Sampling for air emissions survey has been completed for both the 1,3-BG and the DAA units.

DAA Unit Support - No Laboratory support necessary.

DAA Laboratory Reactor Study - A report on the effects of water in the acetone feed to the DAA reactors is in progress. Water in the reactor feed suppresses the mesityl oxide make, which will increase unit efficiency, and may result in a more stable product with respect to color build.

Monitoring T-295 Residue for Acetone - T-295 residue samples are being analyzed in the Laboratory for acetone. Acetone concentration profiles of the acetone recovery column (T-295) in the DAA unit taken recently showed a potential efficiency loss in DAA from acetone sewered in the residue. (The column profiles were taken by J. Chervenka and G. D. Boyd to assist the Celco Plant in eliminating mesityl oxide in their acetone recovery operation [JC-97, GDB-09-77]).

Initial results of the current study show 1.0-2.0wt.% acetone in the T-295 residue. This is estimated to be about 0.3-0.7% efficiency loss. The previous column profile had indicated 4.4wt.% in one sample. More samples are being analyzed and a complete report of the findings will be published.

Pentaerythritol
R. G. Briell

Pentaerythritol Efficiency - No progress.

Pentaerythritol (PE) Unit Air Emissions Survey - Sampling of vent emissions in the PE unit has begun in accordance with an air emission survey. The condensable material of the samples is currently being analyzed in the Lab. The non-condensables have been sent to CCCTC for mass spec analysis. The remainder of the vents will be sampled next month. Upon completion of all sampling, a joint report with Process Engineering will be issued.

Update of PE Unit Methods - Completion of the revised analytical methods manual is being delayed due to lack of delivery of a few items that are necessary in one of the new methods. Expected delivery is early December, after which the manual should be completed and issued to the unit lab.

Sulfate in PE "A" Mother Liquor - Analysis of the PE AML stream for sodium sulfate is being continued. Results of analysis in late November showed

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a higher than expected sodium sulfate content in the 1.0-1.4% range (contained salt basis). During Pure PE production, Virginia Chemical, purchaser of the AML stream, requests a sulfate concentration of 0.5%. Analysis of the stream in early December showed a decline to the 0.5-1.0% range. Daily monitoring of the stream will continue in an effort to understand all the factors which cause high sulfates in AML.

Trimethylolpropane
L. Mayerle

Trimethylolpropane (TMP) Unit Support - None required.

TMP Unit Air Emission Survey - Vents on the TMP unit have been sampled for the current air emission survey. Analyses on condensed samples are in progress in the Laboratory. Samples of non-condensable materials from each vent have been sent to the Technical Center for analyses by mass spectrometry. Results will be published in January in a joint letter with Process Engineering.

Alternate TMP Purification Scheme - Assembling of extraction equipment is essentially complete. Initial startup of the Laboratory extractor is scheduled for the second week in December.

TMP Unit Analytical Methods Manual - The issuance of the revised methods manual is being delayed pending the delivery of a specific ion electrode for analyses of low sodium formate (NaFo) concentrations. A method utilizing the new electrode will be developed and written upon its delivery. This will complete the manual.

Methanol Synthesis
F. R. Dow

Fuel Gas Quality - Fuel gas to MS-II was analyzed on November 4 (97.15 mol% CH₄), and November 15 (96.88 mol%). These two values compare almost exactly with previous natural gas analysis.

The coalescer total sulfur process analyzer is still out of service, awaiting parts from Bendix.

The Laboratory has not performed sulfur analysis due to other priorities.

MS-II Analytical Support - Previous discrepancies between the Lab and process analyzer analysis for components in DPG, Selas and combined reformed gases appear to have been resolved. An inaccurate process analyzer standard was found to be the problem. A new process analyzer standard cross-checked with duplicate Lab blends corrected the problem.

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Oxo, Butanol (BuOH), Propanol (PrOH)
A. J. Bacon

Oxo, BuOH, PrOH Unit Support - Work was continued to try to concentrate Oxo run #3, ash #2. We were able to further concentrate it approximately 4-fold to approximately 10% rhodium, but that is all. Engelhard will proceed with further ashing of the material. A report was issued.

Houston S & D requested that we determine if any TPP exists in the Oxo catalyst ashes. A small amount of oil could be extracted from both run #3, ashes 1 and 2 (less from ash #2). The oil did contain TPP and TPPO in small amounts (approximately 1% in ash #1).

Cooling problems led to the opening of T-212 overhead condensor. It was found to be plugged with a sludge which the Lab determined to be high in iron and zinc phosphates. This probably came from Betz additives.

Work was started on reviewing Lab sample schedules and unit methods manual writing.

Work was started on sampling and analyzing for the plant air emissions survey.

Rhodium Accounting - We are again having trouble determining catalyst level in the reactor; however, available data shows no trend toward rhodium loss through the month.

Reactor Accountability/Stability - We have been trying to determine what is causing the high rhodium deactivation rate being experienced through the present run. One of the things that was noticed was an unexplainably high nickel content in the catalyst. How nickel would affect the rhodium, we are not sure; however, the concentration has increased over twice as fast during this run, than last. Also, the nickel concentration on a molar basis is approximately equivalent to that of inactive rhodium. Nickel tetracarbonyl was found in 5MM girdler feed to Oxo at 50 - 100ppb. This concentration is far short of that required to account for the approximately 20lbs. of nickel that is present, so the source of the nickel is a puzzle. Work will continue.

Studies to Eliminate Oxo T-210 - M. E. Harris

Progress has been made using carbon to adsorb TPP from butyraldehyde. Carbon capacity seems to be low (~0.05% w/w). Work continues.

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Process Technology
B. D. Kerr

Technical Report Abstracting - Preparation of technical report abstracts is current.

Competitive Product Data - Information has been obtained from Mr. Oliver Axtell's group in New York concerning competitive producers of Chemcel's major products. Estimated production rates and manufacturing methods are listed for many of these products.

Stabilizer Addition Control for Formaldehyde - Problems with the addition of Metolose stabilizer to sales grade formaldehyde solutions have been defined in a letter (BCK-29-77, December 2, 1977). Recommendations were made for a concerted effort between Operations and the Technical Departments to improve the addition system.

Gelcon T-240 Overhead (OH) Feed to MO-II - A letter has been issued (BCK-28-77, November 21, 1977) questioning certain aspects of the newly installed tank system for feeding T-240 OH to MO-II.

Statistical Data from TMP Operations - Work is currently being done on obtaining statistically accurate information on TMP unit operations. Unit operating data, unit laboratory data and Main Laboratory analytical data are being collected for the month of September, 1977, to provide an accurate description of TMP unit operations.

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Current Special Problems Projects

Project	Chemist	Priority	Justification	Estimated Completion Date
MO Efficiency Improvements With Trace Amounts of Halogenated Hydrocarbons	Presley	2	Raw Material Savings	Undetermined
MO Catalyst Screening		2	To Establish Alternate Suppliers And Improve Catalyst Quality	Continuing
MO Catalyst Reuse		2	Reduce Silver Inventory	January 1, 1978
MS-II Crude to MO		1	Steam Savings	Plant Testing Complete by January 1, 1978
Reduce Methylal Formation In MO Distillation Columns		1	Raw Material Savings	Plant Testing By February 1, 1978
T-240 Overhead/MO-II Acid and Methyl Formate Balance	✓	1	Raw Material Savings	Lab Work Complete By December 30, 1977
Stability of 50% and 52% Formaldehyde	Harris	1	Maintenance of Business	February 15, 1978
BOD Analytical Methods Manual	Smith, Stasney	2	Maintenance of Business	March 31, 1977
Anaerobic Pilot Testing Of Chemical Waste Streams		1	To Test Anaerobic Process As Alternate BOD Expansion	January 1, 1979
Purchase Specification Update		2	Maintenance of Business	May 1, 1978
Formaldehyde Blending Unit Regeneration Study	✓	2	To Support Unit Expansion	February 1, 1978

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Current Special Problems Projects

Project	Chemist	Priority	Justification	Estimated Completion Date
OSHA Monitoring	Jackson, Pena	1	Ensure Employee Health and Safety OSHA Compliance	Continuing
1,3-BG Unit Emissions Survey	Hancock	1	Ensure Compliance with Standards	January 1, 1978
1,3-BG Unit Support		1	Maintenance of Business	Continuing
1,3-BG Cost Reduction		1	Cost Reduction	February 1, 1978
DAA Unit Support		1	Maintenance of Business	Continuing
DAA Unit Emissions Survey		1	Ensure Compliance with Standards	January 1, 1978
DAA Laboratory Reactor Study		1	Increase Unit Capacity and Steam Savings	January 1, 1978
Monitor T-295 Residue Acetone Loss	↘	2	Minimize Efficiency Loss	January 1, 1978
PE Efficiency	Briell	2	Decrease Raw Material Cost	April, 1978
PE Unit Emissions Survey		1	Ensure Compliance with Standards	January 1, 1978
Reduce Sulfate in PE AML	↘	2	Comply With VCI Request	December 1, 1977

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Current Special Problems Projects

Project	Chemist	Priority	Justification	Estimated Completion Date
Update PE Unit Lab Methods	Briell	1	Maintenance of Business	February 1, 1978
Acetate Unit Emissions Survey	↓	1	Ensure Compliance with Standards	January 1, 1978
PE Unit Support	Briell, Mayerle	1	Maintenance of Business	Continuing
Paraform Material Balance	Hilbrich	2	Possible Raw Material Savings	February 1, 1978
Paraform-Formcel Support	Hilbrich, Briell	1	Maintenance of Business	Continuing
Acetate Unit Support	↓	1	Maintenance of Business	Continuing
Alternate n-BuAc Process	Hilbrich	2	Steam Savings	February 1, 1978
Paraform, Formcels, Esters Unit Analytical Methods	↓	1	Maintenance of Business	January 1, 1978
TMP Unit Support	Mayerle	1	Maintenance of Business	Continuing
TMP Unit Emissions Survey	↓	1	Ensure Compliance With Standards	January 1, 1978
Alternate TMP Purification Scheme	↓	1	Energy and Raw Material Savings	February, 1978

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Current Special Problems Projects

Project	Chemist	Priority	Justification	Estimated Completion Date
TMP Unit Analytical Methods Manual	Mayerle	1	Maintenance of Business	February 1, 1978
Fuel Gas Quality	Dow	2	Improve Fuel Gas Accountability	Continuing
MS-II Analytical Support		1	Maintenance of Business	Continuing
T-240 Overhead to M0-II		1	Cost Savings	December 15, 1977
Crude Methanol to M0-IV	↓	1	Cost Savings	January 1, 1978
Oxo, Butanol, Propanol Support	Bacon	1	Maintenance of Business	Continuing
Oxo Reactor Accountability/Stability	↓	1	Improve Reactor Control	Continuing
Rhodium Accounting		1	Maintenance of Business Catalyst Savings	Continuing
Studies to Eliminate Oxo T-210	Harris	1	Steam Savings	May 1, 1978

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