Monsanto Company • W. G. Krummrich Plant

LABORATORY OPERATION SUMMARY

FOR THE MONTH OF DECEMBER 1972

W. G. Krummrich Plant	General Offices	
G. L. Bratsch W. C. Engman R. L. Fields G. A. Hippe D. K. Lynch S. H. Jackson Laboratory Supervisors	D. Danna (4) D. B. Hosmer D. W. Jackson R. E. Keller J. C. Weber	J. T. Bell - Anniston O. E. Dolin - Nitro R. A. Geisman - Queeny R. L. Wiese - Queeny J. B. Willmore - Delaware River
Circulate to: A. E. Leisy J. C. Hume	Highlights Only: H. C. Carder P. W. Edwards J. R. Savage	

MONS 038335

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H I G H L I G H T S

No minor injuries were reported in December. This was the sixth consecutive month without an injury.

The overall housekeeping rating based on the Plant-wide inspection was E. Ed Layton and Hap Horner conducted a quarterly housekeeping inspection prior to Plant-wide inspection.

No documented errors were reported.

Work unit cost, Lab cost as % of Plant cost, and % of personnel exceeding lost time showed negative variances for the month compared to 1972 objectives.

Lab personnel and their families enjoyed a Lab Christmas decorating party on December 14.

AR&D work included the following:

Nitroanilines

1. AR&D analyzed mother liquor samples from the ONA process to assist in an investigation for debottlenecking the ammonia still.

2. Samples of ONA and PNA were analyzed for polychlorinated biphenyl content.

Chlorophenols - AR&D determined the composition of wet fractions from the refined dichlorophenols process to provide data for a material balance as a first step in yield improvement and pollution reduction.

Monochlorobenzene - AR&D measured the benzene content of HCl off-gas samples in order to provide data for considering possible reduced carbon usage.

Para-Phenetidine - In order to provide input for new product evaluation, AR&D obtained differential thermal analysis data on a sample of still residue.

Santoflex 13 - AR&D analyzed samples of catalyst for suspected poisoning elements as a possible cause of extended reaction rates.

Compressed Hydrogen - Liquid drained from the mercury removal bed inlet was analyzed by AR&D for composition and mercury content in order to determine the source of the material.

Analytical Instrumentation

1. Department 784 (Compressed Air). An expanded range detector was installed in the dew pointer which is capable of reading points 100°F below ambient. An alternate system has not yet been selected.

2. Department 221 (Nitrochlorobenzenes). Redesign of the system to pick ONCB peaks on the crude column control system is complete. Components for the system are being assembled. System is to be ready for trial by January 15, 1973.

Computer/Statistics

1. Computer Replacement Project. Facilities modification is 80% complete. Cable and plugs need to be placed. Applications manuals received and reviewed. No job setup will be done until after installation. Control stations have been received and are being modified.

2. Dept. 255 (4-Nitrodiphenylamine). Reactor variable analysis is complete. Work on data from amendment testing will be done as requested by Process Technology.

3. During December there were 1728 opportunities on defined GLC jobs which produced 1607 acceptable answers (93%). 783 digitizer runs were made and 10 off-line entries were made with an average calculation time of 10 minutes/entry. Calculation costs were $2.50/sample.

Ecology

AR&D performed the following work to support environmental control projects.

1. Samples of Delaware River Plant effluent were analyzed for nine metallic parameters.

2. A report was issued describing the investigation of a possible alternate reagent, 3 methyl-2-benzothiazoline hydrazone (MBTH), to replace the currently used 4-amino-antipyrine (4-AAP) in phenolics measurement. All the phenolics tested showed better sensitivity in the MBTH system. Further work would be necessary before conversion could be made.

3. The organic and inorganic chloride content of waste treatment plant effluent was determined to help select material of construction for the new treatment plant.

4. A number of parameters were determined on Sauget Village waste water.

5. The portion of the Federal EPA procedure for PCB analysis that utilizes the silica gel microcolumn for the separation of PCB's from pesticides was evaluated. One microcolumn was standardized with 1242 and 1254 Aroclors. This microcolumn is now available for analytical application where such separations are necessary.

Training/Administration

Sam Drexler attended a seminar on the Miran Infrared Gas Analyzer in Chicago.

H. J. Horner

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I. Safety

No injuries were reported in December. This was the sixth consecutive month without an injury.

Sam Drexler conducted the Laboratory Safety Meetings for December. This was the second session of a two-part series on "Toxicity of Most Frequently Encountered Laboratory Chemicals".

II. Housekeeping

Ed Layton and Hap Horner conducted a Lab-wide quarterly housekeeping inspection and noted areas needing improvement or correction. The rating received on the Plant-wide monthly housekeeping inspection was E.

III. Cost Control

	Current Month	YTD	Objective	Variance as % of Objective (YTD)
Deviation from budget*	7541	94945	0%	8.8
Cost/Work Unit* 1.	1.04	.986	.95	-3.8
2.	1.14			
Lab Cost as % of Plant Cost*	1.75	1.686	1.5	-12.4
Overtime	0.8	1.8	4.5	60.
Work Units/Manhour	15.2	16.2	13.5	20.
Lost Time	3.1	3.5	3.5	--
%Exceed Lost Time	28.6	20.4	15	-36.
Reduction in Workload (Work units/month)	120**	2976	-	-

*One month behind
**The reduction in workload resulted from the elimination of crystallizing point determinations on ozonated $POCl_3$ samples.

1. Includes productive time (Lab Overhead) not charged directly to a department. This results in a lower figure than actually charged out.

2. Actual cost of work unit to departments.

IV. Analytical Service

Two samples of Coolanol 25 were run for L. W. Bannister. One was run for electrical properties and earth treated to up-grade the material. The other sample was run for flash point and H_2O.

Ten samples of DDA were run for 247 on a low pressure run, to see if they could make DDA in a different lower pressure vessel freeing an autoclave for making Santoflex.

A sample of transformer fluid from Queeny was run for analysis #1 as listed in the guide book.

V. Personnel

No personnel changes during the month.

	Anal. I	Sec. II	AR&D	Lab. Services	Admin.	Total
Analysts	10	10				20
Technicians	1	1	6	6		14
Shift Leaders				4		4
Chemists			4			4
Supervisors	1	1		1	1	4
Porters				3		3
Clerks				2	1	3
Total	12	12	10	16	2	52

VI. Summary of Lab Service Operation

H. Horner (Lab Porter) continued to recuperate at home after having surgery on 11/6/72.

Air Handling System Filter Changes - Work to change purafil media and pre-filters in the #1 and #2 air handling systems started on 12/11. No additional work since that date, due to cold weather and higher priority work for Area #5 machinists.

SIAM Programs - No laboratory SIAM work completed YTD due to higher priority job assignments for Area #5 shop personnel.

Sample Room Lighting Improvement - One additional light fixture was installed in a dark area in the Sample Storage Area to eliminate a potential hazard.

Solvent Shed Shelving Replacement - Twenty badly rusted shelf inserts and brackets in the Solvent Storage facility were replaced to eliminate an unsafe condition.

Lab Relamp - A spot relamp of Lab fluorescent lighting was completed the second week of December.

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Electrical Power Outage - The Laboratory encountered a ten-hour power outage on 12/7 when a feeder cable from the 10-19 substation failed. The 10-1 substation feeder was still out from the failure on 11/25 and could not be used as back-up. Gas heaters and portable electric generators were brought into the Lab for space heating and emergency lighting. No major problems or damage to the facility resulted.

Cost Reduction - Six cases of vaccine bottles were reclaimed during the month for a $180 savings.

The Coleman Mercury Analyzer was modified to eliminate a re-occurring problem of low gain in the amplifier. The modifications appear successful at this time.

A hot-wire glass cutter was constructed for the Lab Service's glassblower.

An electrode was constructed for AR&D personnel and assistance provided in measuring conductance on some special samples.

One hundred hours of work during the month on preparation, modifications, assembly and installation of control boxes for the changeover to the EAI Computer. All instrument technician work is complete.

VII. Analytical Research and Development

I. General Process Chemicals

A. Chlorine/Alkali - A status report was issued describing methods adaptation work to accurately assay raw material KCl and the analytical data obtained to date. This work is essential to establishing the real potential KCl cost savings. Schutzenhofer

B. Nitrochlorobenzenes - A memo was issued stating the necessity for converting the mixed acid calculation program to the Data 100 Terminal when the Laboratory Computer changeover occurs. Gloeckner

C. Nitroanilines -

1. Mother liquor samples from the Orthonitroaniline process were analyzed to assist in an investigation for debottlenecking the ammonia still. Webb/Briggs

2. Samples of Paranitroaniline and Orthonitroaniline were analyzed for Polychlorinated Biphenyl content. Schutzenhofer

D. Chlorophenols - The composition of wet fractions from the refined dichlorophenols process was determined to provide data for a material balance as a first step in yield improvement and pollution reduction. Berner/Drexler

E. Phosphorus Oxychloride - Several random samples were analyzed for arsenic and heavy metals content in order to satisfy a customer request. Briggs

F. Sulfuric Acid - Samples returned from a customer were examined microscopically to determine the cause of contamination. Webb

G. Monochlorobenzene - The benzene content of HCl off-gas samples was measured in order to consider reduced carbon usage. Berner/Francis

II. Plasticizers

A. Phosphate Esters - The conductivity of Santicizer 140 residue was determined to assist in the design of distillation process instrumentation. Berner

III. Rubber Chemicals

A. Para-Phenetidine - Differential thermal analysis data were obtained on a sample of still residue. This was necessary to provide input for new product evaluation. Drexler

B. Santoflex 13 - The percent solids and platinum content was determined in current production material. Berner

2. Samples of catalyst were analyzed for suspected poisoning elements as a possible cause of extended reaction rates. Webb

C. Compressed Hydrogen - Liquid drained from the mercury removal bed inlet was analyzed for composition and mercury content in order to determine the source of the material. Webb

IV. Detergents and Phosphates

A. Santophen 1 - A sample of Therminol 66 heat transfer fluid from Dept. 239 was analyzed for polychlorinated biphenyl content. Drexler

V. Analytical Instrumentation

1. Department 784 (Compressed Air). An expanded range detector was installed in the dew-pointer which is capable of reading points 100°F below ambient. An alternate system has not yet been selected. Deming

2. Department 221 (Nitrochlorobenzenes). Redesign of the system to pick ONCB peaks on the crude column control system is complete. Components for the system are being assembled. System is to be ready for trial by Jan. 15, 1973. Deming

VI. Applications Research

1. The portion of the Federal EPA procedure for PCB analysis that utilizes the silica gel microcolumn for the separation of PCB's from pesticides was evaluated. One microcolumn was standardized with 1242 and 1254 Aroclors. This microcolumn is now available for analytical application where such separations are necessary. Schutzenhofer

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VII. Computer/Statistics

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VIII. General

A. Ecology

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2. A report was issued describing the investigation of a possible alternate reagent, 3 methyl-2-benzothiazoline hydrazone (MBTH), to replace the currently used 4-amino-antipyrine (4-AAP) in phenolics measurement. All the phenolics tested showed better sensitivity in the MBTH system. Further work would be necessary before conversion could be made. Heumann/Berner

3. The organic and inorganic chloride content of waste treatment plant effluent was determined to help select material of construction for the new treatment plant. Webb

4. A number of parameters were determined on Sauget Village waste water. Webb

IX. Training/Administration

1. Sam Drexler attended a seminar on the Miran Infrared Gas Analyzer in Chicago.

2. Sam Drexler conducted the Laboratory safety meetings for December. This was the second part of a two-part series on the "Toxicity of Most Frequently Encountered Laboratory Chemicals".

H. J. Horner

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Statistical Summary

Analytical Research and Development

December 1972

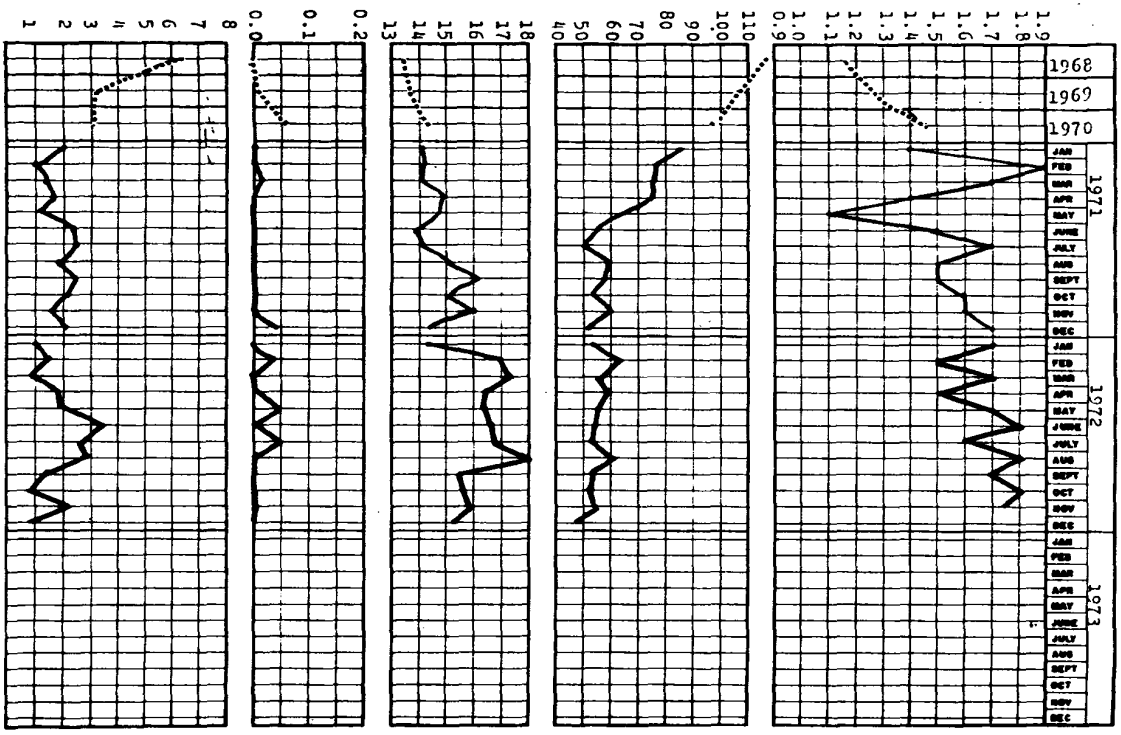
Safety	Current Month	YTD
Injuries	0	0
Safety Meeting Attendance, %	100	97.5
Housekeeping		
Rating	E	E
Time Distribution		
Productive Time (% of total hours worked)	84.2	87.02
Research (all phases) (% of productive time)	34.5	46.2
Service to Production (% of productive time)	2.6	15.5
All Others - Service to Sales, Research, Instrumentation, Training, etc. (% of productive time)	62.9	38.1
Methods Work		
New methods	0	31
Methods revised	0	11
Tentative methods published as Standard WGK	0	51
Length of Completed Projects		
<1 manday	5	89
1-10 days	12	173
>10 days	2	26
Supply Cost		
Dollars/1000 work units	52.5*	73.18
Lost Time		
% of total hours worked	2.6	5.0

*one month behind

W. J. Horner

H. J. Horner

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Non-exempt Overtime as % Total Manhours Worked
Errors/Man Month(2000 Work Units)
Analytical WU/Analytical Manhours
Routine Work Load in # Analytical WU
Routine Lab Cost as % Total Plant Operating Cost
1968
1969
1970
1971
1972
1973
LABORATORY OPERATION

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