MONSANTO CHEMICAL COMPANY
ANNISTON, ALABAMA

ANNISTON LABORATORY REPORT FOR 1963

HIGHLIGHTS

Thirteen analytical methods were developed or revised. Three major process studies and/or method developments completed. Approximately 40 minor process studies or work to assist Production and Sales were carried out. Process studies and work to assist Production or TSD has about doubled during the past year.

Laboratory and Sales samples Department operated within budget. A record number of sales samples were shipped. Laboratory was expanded to use hallway as an instrument room and provide office space for chemists.

Four general training meetings were held for laboratory personnel. One man received a BS degree in Chemistry and three analysts are working toward a degree. Minor injuries reduced 18% from previous year and there were no serious or near-miss accidents.

I. MAJOR PROCESS STUDIES

A. Completed statistically designed experiment to check effect of nitrogen sparge during chlorination of thio acid. Data indicates there is a significant increase in intermediate assay and yield for sparged material. (150 manhours)

B. A statistically designed experiment was carried out using a xylene condensation process for methyl parathion. The addition of xylene after the condensation step, but before washing, increased yield 2% over the regular procedure. Due to the change in specific gravity, settling time is slightly longer. (170 manhours)

C. Two analytical methods were developed for determining assay of Niran granules. One procedure - Ultra Violet spectrophotometric resulted in considerable time savings. About 150 samples were analyzed to check outside contractors operation. Methods, standards, and advice furnished two private laboratories who furnish analytical service to the contractor. (180 manhours)

II. METHODS DEVELOPED OR REVISED

	Method	Number	Type	Manhours
A.	Assay of EP-201	077	New	8
B.	% EP-201 in Pyranol 1470	078	New	16
C.	Trace Phosphorus in Terphenyl	088	New	20
D.	Sulfur Dioxide in Air	087	New	24
E.	DTA of Chlorinated Ethyl & Methyl Thio Acid	080	Revised	8
F.	Thermal Stability and Vapor Pressure of Therminols	-	New	40
G.	Assay & P-NP of Niran 63	081	New	24
H.	Color of HB-40	083	Revised	8
I.	Assay of Niran Granules (UV)	089	New	16

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Method	Number	Type	Manhours
J. Assay of Niran Granules (Hydrolysis)	090	New	16
K. Thio Isomer in Niran and MEP	085	Revised	12
L. Niran in Waste Water	086	Revised	4
M. Standardization of HCl	084	New	8

III. MINOR METHOD DEVELOPMENT AND INVESTIGATIONS

A. Minor Method Development or Investigations

1. Determined accuracy and precision of GLC procedure for Biphenyl in benzene feed samples. Standard deviation is about 2.5% of amount present. (26 manhours)

2. Checked effect of hold period on chlorination level and assay of chlorinated ethyl thio acid. Normally, chlorination level increase with time. (20 manhours)

3. Investigated hydrolysis rate of parathions and interferring substances on detection method. (34 manhours)

4. Developed methods for assay, chlorine, and sulfates in demister water. (26 manhours)

5. Completed study on analytical precision of sodium biphenyl procedure for determining the chloride content of benzene. (20 manhours)

6. Identified returned sample from Kemidgroa as Aroclor 1254 contaminated from masking tape. (8 manhours)

7. Ran laboratory demonstration for producing Santowax WR and special analyses on material produced. (40 manhours)

8. Evaluated DuPont para-nitrophenol. Flaked material and light color. (8 manhours)

9. Ran numerous tests to determine cause of low and variable resistivity of Aroclor 1242. Found bare spots in lining of storage tank. (32 manhours)

10. Performed preliminary identification of sludge in methyl parathion. Probable cause was hydrolysis and polymerization from excess moisture. (16 manhours)

11. Investigated two procedures for color determination of Santowax. Gardner color standards are practical for control. (12 manhours)

12. Investigated use of refractive index to control hydrogenation of HB-40. This procedure is considerably faster than the specific gravity determination. (10 manhours)

13. Ran several DTA analyses to determine the stability of chlorinated thio acid throughout the chlorination process. (24 manhours)

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14. Procedure developed and study of heat stability of Santowaxes underway. (16 manhours)

15. Working with Ag Research to develop and refine IR and GLC procedures for assay of Niran and Methyl Parathion. (32 manhours)

16. Investigated a colormetric procedure for determining sulfate content of shubbery. Work dropped as total sulfate content is too high to detect differences caused by SO_2. (22 manhours)

17. Added a wax solubility test to special customer requirements for Aroclor 5460. (18 manhours)

18. Reviewed suppliers analytical procedures for KCl. (12 manhours)

19. Completed study to determine sodium concentration in KCl brine and KOH. (18 manhours)

B. Assistance to Production, TSD, and Sales

1. Prepared a calibration curve of chlorine vs. specific gravity of Aroclor 1142. (20 manhours)

2. Ran evaluation tests on HB-40 produced from chlorine plant hydrogen. Results show HB-40 to be satisfactory with much lower (nil) explosive content. (16 manhours)

3. Analyzed 10 competitive KOH samples and reported results to Sales personnel. Anniston and Hooker material were equal, other materials inferior. (22 manhours)

4. Assisted Production Department in preparing and evaluating two blends of Aroclor 1242 and TTCB or TCB. General Electric will evaluate as a possible transformer fluid. (40 manhours)

5. Ran several tests to identify foreign material in methyl parathion. Found water from xylene and filter aid had contaminated material in blend tank. (10 manhours)

6. Trained Messrs. Shannon and Trehan of Electronic Components, Inc., in Arolcor 1242 analyses and advised on laboratory equipment to purchase. (24 manhours)

7. Set up procedures for analyzing and reporting results of used Therminol samples returned from customers. (8 manhours)

8. Analyzed material from Niran catch pots to assist in near-miss accident investigation. (12 manhours)

9. Analyzed clarifier water to assist in TSD study. (8 manhours)

10. Special analyses performed on Santowax OM for Canadian GE. (14 manhours)

11. Assisted a customer, Mallory, in determining contaminant in Aroclor 1242. Contaminant was pump oil that entered system during electrical outage. (10 manhours)

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12. Several special blends of Aroclor 1242, 1248, and TCB or TTCB prepared and analyzed and shipped to customers. Materials are being evaluated by Westinghouse as possible transformer fluid. (38 manhours)

13. Developed procedures for, and analyzed, approximately 100 samples of Niran Granules. (180 manhours)

14. Identified Therminol in effluent stream for customer. (6 manhours)

15. Evaluated several competitive samples of Biphenyl for Development Personnel. All were by-product materials and contained naphthalene. (14 manhours)

16. Visited Electronic Components, Inc. to help solve analytical and refining problems with Aroclor 1242. Customer now operating satisfactorily and switching from Aroclor 1254 to Aroclor 1242. (32 manhours)

17. Three new tests - solids, chlorides, and C.O.D. - instituted on ditch water to Snow Creek. (6 manhours)

18. Assumed effluent analyses previously performed by production technician - adds approximately 400 samples per month.

19. Several special analyses on Niran and effluent to assist in pollution study. (40 manhours)

20. Chief Chemist visited Clemson College to resolve differences in analytical procedures for methyl parathion. Clemson agreed to check any questionable results using our procedure. (32 manhours)

IV. LABORATORY OPERATION

A. Costs

Laboratory and Sales Sample Services operated well within total budget. Only two items were over budget, mechanical expense due to lab expansion and depreciation, both these items are controlled by other departments. Labor, salaries, supplies, and travel were significantly under budget.

B. Productivity

Without an increase in manpower, the laboratory assumed effluent samples previously analyzed by production technician and an increase in process research and customer service analyses. Cost per 1,000 lbs. was 66¢ and manhours per sample remained at 0.38. A record number, 5128, of sales samples were shipped at an average cost of $2 per sample. Time spent on process studies and work to assist other departments about doubled from last year. Tests per sample have increased significantly for Santowax products.

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C. Improvements

The laboratory was expanded to include a hallway as the instrument room. This has cut down on instrument maintenance mainly from less corrosion. An office for chief chemist and analytical chemist was provided. Two hoods were purchased and installed, one for use in perchloric acid digestions. A P&E Model 800 GLC instrument was purchased and installed for Aroclor analyses. A F&M Model 810 GLC instrument is on order for Niran analyses.

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D. Safety

There were no major injuries, and minor injuries were reduced by 18%. Two additional hoods installed, one explosion proof for handling flammable solvents and one for perchloric acid digestions, which will eliminate explosion hazards from this operation. Two persons attended training meeting in operation of fire fighting equipment.

E. Personnel and Training

Four general training meetings were held for all laboratory personnel. One man, Norman Madison, received BS degree from Jacksonville State College, and three other analysts are working toward a degree. All personnel trained so that at least three perople can perform any lab tests. All non-exempt personnel attended meetings, held by Personnel Superintendent, on Monsanto policies. Chief Chemist attended Pittsburg Analytical Symposium, visited WGK plant, Organic and Ag Research. Chief Chemist visited Electronic Components, Inc. to advise on analytical and refining problems with Aroclor 1242. Analytical chemist visited Organic Research for instrumentation training. George Jones served as judge at Oxford High School Science Fair. Owen Dolin served as judge at Northeast Regional Science Fair. Secretary attended IBM school.

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