cc: C. Paton
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MONSANTO COMPANY
St. Louis, Missouri

TRIP REPORT NO. IF-1

E. I. Du Pont
Wilmington, Delaware

Contacted: Dr. P. Gebhardt
Project Manager

B. Kidner
Purchasing Agent

Deepwater, New Jersey

Contacted: Dr. P. Meunier, Director
Dyes & Chemicals Lab

Samuel Loper, Supervisor
Carpet Dyeing & Finishing

R. E. Ritter, Supervisor
Tech Service
Dyeing & Finishing,
Du Pont Textile Fibers
(Center Road)

G. C. Culling, Supervisor
Non-Textile Chemicals

R. J. Thomas, Tech. Rep.
Labs

Date of Calls: January 4, 1972

Present for Monsanto: D. R. Pogue

Objective (Wilmington):

1. Determine progress of decachlorobiphenyl program

2. Obtain written confirmation that PCB is not present in end product.

Results:

Project remains alive, however, pilot plant operations have slowed. Du Pont efforts during the last 4-5 months have concentrated on reducing PCB content in their end product. Du Pont management is aware of and

carefully judging their position on this new product. They have analyzed pilot production and find PCB residual can be held to "less than 1 ppm". Although somewhat pessimistic, Gebhardt is trying to reduce this to lower levels. He hopes 1 ppm or less will be sufficient for approval from both Du Pont to continue the project and from Monsanto to supply DCBP commercially.

Du Pont informed that it was entirely possible that 1 ppm levels would not be satisfactory for continued supply by Monsanto beyond our present imported stocks (approximately 7,000 pounds). They expect a decision on the future of this program within Du Pont to be made around July 1972. Agreed for another meeting about that time, unless a decision by either party influencing this business was made in the interim.

Received blanket order for 1972, with an order for 1,000 pounds in February 1972.

Objectives (Deepwater):

1. Assess future dye carrier market in textiles.

2. Determine future demand for biphenyl in this market.

Results (Deepwater):

The Dyes and Chemicals Group, Organic Chemicals Department includes dyes, fire retardants (Zepel intermediates), wetting agents and dyeing assistance. Markets include leather and textiles. Du Pont has marketed Latyl brand (biphenyl based) dye carriers under special agreement with Burlington Industries for some time. They do not have any other dye carriers. Meunier indicated they did not have any plans for expanding into dye carriers in the future.

Du Pont feels the dye carrier market will show little growth in the future. Polyester production is projected at:

1960	120 M pounds
1969	1270 M pounds
1979	3320 M pounds

Polyester increase means more dyeing, however, carrier usage will be offset by less carrier required per pound of fabric. (NOTE: approximately 70% of the above polyester production is dyed) Typical dye carrier consumption should drop from an average of 6-8% on the dyed fabric to

2-4% within the next three to five years. This is due to the increase in popularity in the high temperature jet dyeing machines which were introduced successfully several years ago. Du Pont correctly assumed that Monsanto's dye carrier biphenyl sales showed less growth during the period 1969-1971 versus prior years.

Main issues confronting dye carriers during the 1970's will be:

1. Flammability legislation--carriers should be either easily removed from the fabric or not adversely affect the fabric passing flammability tests (i.e., channel and pill tests).

2. Pollution aspects--product biodegradability and low toxicity and odor are becoming important in dye carrier selection. Du Pont felt that biphenyl was satisfactory on pollution and toxicity, however, complaints are commonplace on the odor from plant stacks. Du Pont was optimistic about two products claiming "low residual odor." These include Geigy's Irgasol OL (our former 1221/1109 market) and Ventron's Actalon AC-6. They report companies in the Patterson, New Jersey area are using Irgasol OL because of low residual odor advantages. I could not confirm the specific accounts. Du Pont is not aware nor were they told that we were providing the raw material for Irgasol OL.

Du Pont sees the dye carrier market place changing. They confirmed that the increased costs of high production dyeing equipment and pollution control would force smaller concerns from the market. Du Pont cited the trend towards increased internal production of textile dyeing and finishing chemistries within the mills. Companies who now own their own chemical companies include United Merchant and Manufacturing Company, Cone Mills, J. P. Stevens, Burlington Industries and Barwick Mills (chemical subsidiary: Chamblee). These chemical subsidiaries are now responsible for setting specifications and formulating many of their end products (i.e. dye carriers) for use within all corporate plants.

Biphenyl:

Largest existing market is in carpets. Full impact from high temperature jet dyeing is not yet there, but has reached the apparel market. Here biphenyl is not as advantageous as either butyl benzoate or trichlorobenzene. Although Du Pont was unsure of the reason for biphenyl's disfavor, they cited residual odor as a probable reason. Suggested further contact with equipment suppliers and dyeing mills.

Biphenyl vs. Ortho Phenyl Phenol

They did not feel that biphenyl was considered competitive to ortho phenyl phenol. Ortho phenyl phenol gives improved performance on heat set goods and is required for deeper dyes (i.e., dark blues and blacks).

D. R. Pogue

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