

INTER-OFFICE MEMO **TENNECO CHEMICALS, INC.**

JUL 29 1974

TO Distribution List AT DATE July 26, 1974
FROM Dr. R. T. Gottesman AT Piscataway COPY TO
SUBJECT MONTHLY SUMMARY - JULY 1974

Attached are copies of the Monthly Summary reports for July 1974 covering the activities of the Piscataway laboratories and associated pilot plants at Piscataway and Flemington.

R. T. Gottesman
R. T. Gottesman

RTG/ec

Attachments

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COLORITE 011624

INTER-OFFICE MEMO **TENNECO CHEMICALS, INC.**

TO Dr. R. T. Gottesman

AT Piscataway

DATE July 25, 1974

FROM Dr. F. J. Buono

AT Piscataway

COPY TO

SUBJECT

MONTHLY SUMMARY - JULY 1974NOTICE:**CONFIDENTIAL**

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I. COATINGS INDUSTRYA. Microbiocides

1. Biocide and Compatibility Screening (E. DiBella, P. Minieri,
G. A. Trautenberg, G. Tirpak, G. Kagan, M. Landau)

(a) TOP Candidates

Biocide screening was completed on twenty-three TOP candidates. One compound, Methane sulfonylhexamethylene-tetra ammonium chloride, showed promise and is scheduled for evaluation as a can preservative.

N(2-hydroxymethyl-2-nitro-n-butyl)morpholine, fungicide candidate TOP 3031, showed generally acceptable initial compatibility in both PVA and acrylic systems. Although it showed a high pH at higher concentrations in the PVA, this was not reflected in other physical characteristics.

(b) Chevron Candidate Compounds

Two Chevron compounds, NU-90 and NU-93, showed acceptable initial paint compatibility at all usage levels (.25, .5, and 1.0%) in both the PVA and acrylic test paints.

(c) Maybridge Chemical Candidate Compounds

Twenty Maybridge candidates underwent primary screening this month. One compound, 2-Fluoro-4-bromophenylmaleimide, showed good fungicidal properties. However, it was not more active than our prime fungicide candidate, N(2,6-Diethylphenyl) maleimide.

- * 2. Fungicide Program (G. Trautenberg, G. Kagan, M. Landau)

Compatibility evaluations on the nine paints containing the primary fungicide candidate after one month accelerated aging (120°F) have been completed. The data indicate varying responses in the different paint systems, with the liquid and powder form, over the dosage range of 0.25-1.0%. In general, a use level of 0.25-0.5% is acceptable in all but the alkyd-modified PVA system with the liquid formulation. Unacceptable color development at all levels after aging was observed in this system.

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B. Nuosperse HOH (G. Kagan, M. Landau)

Work on the DeSoto Dew-Freeze-Vacuum Test has been initiated. Tamol 731 and Nuosperse HOH which have been incorporated in paints at the level recommended by De Soto and at 90% of this concentration are being evaluated on TOP-primed panels prior to testing on the limited number of pre-weathered (6 mos.) panels (3) submitted by DeSoto. This was done first to acquire more experience with the test procedure and to determine if adhesion differences could be demonstrated between the two products over an unweathered primer. After the first Dew-Freeze-Vacuum cycle no adhesion failures were noted with either product.

* C. Wacker Vinnapas Dispersions (Latexes) (G. Kagan)

Two Wacker latexes, Vinnapas CEF-10 (Ethylene/vinyl acetate/vinyl chloride) and Vinnapas EZ-15 (Ethylene/vinyl acetate) are currently being evaluated as vehicles for latex paint versus Air Products' Airflex 728 and Airflex 500, respectively. CEF-10 which is recommended for interior and exterior paints is under test in one of each of these systems and EZ-15 in an interior paint (recommended for this application only). Initial paint evaluation results indicate that CEF-10 is generally comparable to Airflex 728 in both the exterior and interior systems. However, it exhibits significantly better freeze-thaw stability than Airflex 728 in the interior test formulation. Vinnapas EZ-15 exhibits generally acceptable performance compared with Airflex 500 with the exception of freeze-thaw stability where EZ-15 is poorer. This suggests that EZ-15 is a "softer" polymer than Airflex 500. Weatherometer tests comparing CEF-10 with Airflex 728 in the exterior paint are underway. After 200 hours of exposure no significant differences have been noted between the products.

* D. Servo Additives (G. Kagan, M. Landau)

1. Ser-Ad FA601, Dispersant

This product, which has been evaluated versus Nuosperse 657 as a dispersing agent for solvent-based paints, looks very promising. It exhibits greater efficiency than Nuosperse 657 on an equal solids basis in standard pigment titrations, faster grinds and less settling in a TiO_2 dispersion and better color and gloss development in a red iron oxide dispersion. An example of the faster grind obtained with FA601 in a TiO_2 dispersion is tabulated below.

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Hegman Grind Readings
of Titanium Dioxide-Long Oil Linseed Alkyd Dispersion
Comparing Ser-Ad FA601 with Nuosperse 657 at Equal Solids Basis

<u>Time, Minutes</u>	<u>Hegman Grind (Cowles Dissolver)</u>		
	<u>Blank Control</u>	<u>Ser-Ad FA601</u>	<u>Nuosperse 657</u>
15	0	0	0
30	0	4.5	1.5
45	0	5.0	2.5
60	2	5.5	4.5

Based on its favorable functionality, this product will be recommended for addition to the TOP Coatings additive line.

2. Serdas GFN, Defoamer

This product has been evaluated in PVA and acrylic latexes and a PVA paint versus Foamacure 142, Nuodex AF-100 and two competitive Diamond Shamrock products (i.e., Nopco NX2 and Nopco NDW). Serdas GFN shows acceptable defoaming activity in latexes but unacceptable defoaming efficiency during paint manufacture as compared with the comparators. It shows no significant performance advantages over the TOP or competitive products which would warrant its incorporation in the TOP additive line. No further work is recommended for Serdas GFN.

3. Ser Ad FA620, Wetting-Dispersing Agent

This was recommended by Servo for use in highly concentrated aqueous pigment dispersions. Attempts in our laboratory to make a red iron oxide dispersion with Ser-Ad FA620 in accordance with a Servo recipe have been unsuccessful. Cal/Ink was consulted on this matter and has provided a test formulation which will be used to evaluate this product. An additional quantity of Ser-Ad FA620 has been requested to complete this work.

4. Ser-Ad FK-321, RL-606/73 Anti-Static Agents

These products are recommended for use in electrostatic spray paints. Their function is to decrease electrical resistance of the coating system and thus reduce or eliminate usage of expensive polar solvents which are normally required. Ser-Ad FK-321 and RL 606/73 and two competitive products have been incorporated in an alkyd melamine coating for resistance measurements. Arrangements have been made for the loan of a resistance meter which will be used to determine how efficiently the additives reduce resistance. After effective levels of the additives have been ascertained, paints containing these will be applied electrostatically by Northeast Electrostatic, Inc., Lakewood, New Jersey, to determine the effects of the additives on finished coatings (e.g., spray efficiency and film characteristics).

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II. LUBRICANTS

A. Crankcase Lubricant (M. H. Knapp, R. G. Smith)

A meeting has been scheduled for July 26, 1974, to discuss the results of Chevron's testing of our base oil (DTDA, standard production and specially purified) with both their standard and experimental additive packages. The results of their evaluation of the failed engine test parts from our testing of R-550 will also be reviewed and then a cooperative test program will be formulated.

B. Two-Cycle Engine Lubricants (M. H. Knapp, R. G. Smith)

The installation of the acoustical chamber, engines and dynamometers is virtually completed with test development scheduled to begin within two weeks.

* C. Replacement for Kendex 0839 in ANDEROL 786 (M. H. Knapp, R. G. Smith, O. Fuchs)

Three paraffinic raffinates which are more readily available than Kendex 0839 are being evaluated as replacements. These products are Kendex 0834 (raw material for Kendex 0839), and Quaker States' St. Marys Resin and Bright Stock Extract. In addition to evaluating these materials as is, the Kendex 0834 has been phenol extracted (using a Kendall-supplied procedure) to produce a product similar to Kendex 0839. In this procedure, separation of the two phases has been found to be extremely difficult. Evaluation test results (see below) indicate that, at this point, extracted material is the most suitable for use. However, oxidation testing of the Quaker State raffinates is under way, and if successful results are obtained (< 10 psi loss), then these unextracted materials would be preferred.

Performance Data - Raffinate Blends*

	<u>Kendall</u>		<u>Quaker State</u>		<u>Lab Extractions of Kendex 0834</u>	
	<u>Kendex 0839</u>	<u>Kendex 0834</u>	<u>St. Marys Resin</u>	<u>Bright Stock Extract</u>	<u>042-147</u>	<u>042-149</u>
Four-Ball EP Weld Load, Kg	140	140	130	130	140	140
Falex EP, Failure, Lbs.	1,000	1,000	1,000	1,050	1,050	1,000
Falex Wear, Wear Units	51	61	67	83	61	58
Oxidation Bomb 100 hours @210°F, psi loss	5	20	-	-	5	5

* Raffinates blended with DTDA and DTDS in ratio used in Anderol 786.

F. J. Buono
F. J. Buono

FJB/amp

COLORITE 011628

INTER-OFFICE MEMO **TENNECO CHEMICALS, INC.**

TO Dr. R. T. Gottesman AT Piscataway DATE July 24, 1974
FROM Dr. A. J. Deinet AT Piscataway COPY TO
SUBJECT MONTHLY SUMMARY - JULY 1974

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I. CHEMICALS/SPECIALTIESA. Fuel Oil Additives (A. Fischer)

In response to an earlier sample of 4% calcium naphthenate sent to Nutmeg Chemical an additional quart was prepared at their request. Also prepared was a pint of a NuXtra Iron, magnesium, calcium naphthenate blend for their evaluation as a fuel oil additive.

B. Formaldehyde Stabilizer (E. P. DiBella, R. Caruso)

- * Pilot plant filtration studies on the use of our palmitic diisopropanolamide (PDIA) stabilizer indicated that haze removal in 50% formaldehyde using a one micron cartridge was not successful unless admixed filter aid was employed. Haze was shown to be due to impurities in the PDIA since a distilled sample (200°C. at 1 mm Abs) yielded a clear solution in 50% formaldehyde and required no filtration. Possible distillation by an outside processor will be determined. Other approaches to a pure product within our own capabilities will also be pursued.

C. Pollution Control (E. P. DiBella)

The precipitation of cadmium as sulfide although effective is not amenable to operation at Piscataway because of the large effluent volume and low metal content. Batch precipitation would be required. Initial tests indicated that passage of effluent through a granular zinc column reduced cadmium to a level of 0.1 ppm. Tests are continuing to determine column capacity and long term effects.

A procedure for removal of cyanide (Fords effluent) via reaction with formaldehyde to form glyconitrile has been confirmed. The method is being optimized and will represent a more economical approach over the caustic-chlorine oxidation route.

II. PLASTICS INDUSTRY

A. Additives

1. Tin Catalysts (A. Fischer)

The sample of NUOCURE 28/zinc octoate blend (3:2 Sn/Zn ratio) submitted to Vicon Products as a silicon system catalyst was found to have superior shelf stability over NUOCURE 28 in their evaluation, but found somewhat high in viscosity for their purpose. Additional samples at higher tin to zinc ratios will be submitted to them as an approach to a lower viscosity product.

2. Powder Stabilizers (S. Hoch, R. Lally, J. Dunn)

- * A powder stabilizer (AG 899) based on a blend of barium, cadmium and zinc salts of p-tert-butyl benzoic and pelargonic acids in combination with a polyol and an antioxidant indicated non-fogging characteristics and heat stabilizing activity equivalent to Ferro 5921A. Laboratory Process Proposals for the preparation of the required barium pelargonate and zinc-p-tert-butyl benzoate are being issued. These along with cadmium pelargonate can be manufactured at Piscataway.

Samples of strontium stearate, strontium pelargonate, zinc octoate-dodecylmercaptide and magnesium maleate were prepared at Flemington's request and submitted to them for evaluation as potential stabilizer intermediates.

3. Liquid Stabilizers (S. Hoch, R. Caruso, R. Lally, J. Dunn)

- * A pilot plant trial run of our barium nonylphenate-tallate-carbonate (23% barium) stabilizer yielded a product comparable in functionality (including plate-out characteristics) to Lubrizol 2106 on an equal metal basis. The laboratory is pursuing a reliable control point to indicate completion of carbonation as well as aiming at a 27% barium product to allow a pound for pound substitution with the Lubrizol (27% Ba) product.

4. Tin Stabilizers (S. Hoch, M. Q. Ceprini, R. Caruso, M. Spalding)

- * A new formulation has been developed for NUOSTABE V-1766 based on a blend of V-1420 (Ca/Zn/P) and V-1562. This product satisfies all functional requirements of the original product and eliminates the periodic haze recently associated with the earlier blend. The preparation of V-1528 will no longer be required.

A one drum pilot plant prepared sample of NUOSTABE V-1958 (R-322) gave promising results in evaluation as a PVC stabilizer at Hampshire Mfg. Co. and resulted in a 10 drum initial order. Borden Chemical has also been sampled with this product and a Pilot Plant Process Proposal has been issued for its manufacture.

Functional evaluation of the tridecyl counterpart of BD-602 indicated it to be equivalent to Argus' Mark 1044. A slight haze has been noted when prepared from currently available tri-decyl alcohol and current work is aimed at its elimination. A shortage of Neodol 25 normally used in BD-602 has necessitated a need for alternate alcohols.

5. Flame-Retardants (E. DiBella, M. Reale, H. Sidi, H. Gould)

- * A micronized hexabromobutene-2 (HBB) was successfully encapsulated by NCR Capsular Products Division, but its evaluation in a standard flexible polyurethane foam indicated no self-extinguishment. No further work with polyether foam will be pursued. The encapsulated HBB was effective at 10PHP in flexible polyester foam and was free of objectionable odor. Additional material is being prepared by NCR for sampling by Scott Paper and others.

- * An improved emulsifiable concentrate of NUOGARD 2,3-P has been developed utilizing TOF, Agrimul A-300 and Poly-Tergent B-200 and will be made available for customer sampling. Our previously used emulsifiers were discontinued commercially. An emulsifiable concentrate utilizing toluene, Agrimul A-300 and Poly-Tergent B-200 was also achieved with Pasadena's hexabromobutadiene and will be evaluated in a textile pad-on application.

Attempts to prepare the originally conceived structure of Butler's DFR-11 have thus far been unsuccessful, but a related salt component, bis(2,3-dibromopropyl)-2-hydroxyethylammonium phosphate was prepared for evaluation. Further synthetic efforts are aimed at preparing the DFR-11 non-volatile component which has been shown to be more effective than FR-2 in polyurethane foam. A bis(2-chlorovinyl)bis(tribromoneopentyl)-1-chloroisopropyl ortho stibinate prepared from Pasadena's acetylene/SbCl₅ product appears to be at least twice as effective as FR-2, but showing some hydrolytic instability. Synthetic efforts to overcome this will be pursued.

In the reactive area compositions based on the condensation of dialdehydes with dialkylphosphites and di/monoethanolamines have shown some promise in rigid foams. These will be chain extended via propoxylation for use in flexible foams.

III. COATINGS INDUSTRY

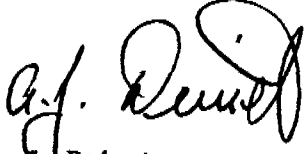
A. Driers (A. Fischer, G. Kagan)

- * A revised Zirconium 18% has been developed based on the partial substitution of 2-ethylhexoic acid by n-heptanoic acid. The latter is less costly and readily available and a 5:3 molar ratio of the respective acids yields a product equal in functionality (semi gloss alkyd drying) to the earlier formulation. The revised procedure also incorporates a higher processing temperature to avoid the plant foam-over problems associated with the more reactive form

of zirconium carbonate now being supplied by Magnesium-Elektron to the Elizabeth plant.

* A revised Copper 12% has been developed based on the use of 2-ethyl hexoic, n-heptanoic and crude naphthenic acids. This was necessitated by the high cost of isononanoic acid and the commercial discontinuance of n-hexanoic acid both of which along with the 2-ethyl hexoic acid were incorporated into the earlier formulation.

A sample of solvent-free lead tallate was prepared and forwarded to Saint Mary's Hospital Medical School of London at their request. This will be used in their studies concerning lead poisoning in children.


A. J. Deinet

AJD/ec

INTER-OFFICE MEMO

TENNECO CHEMICALS, INC.

TO Dr. R. T. Gottesman
 FROM Mr. I. Huppert
 SUBJECT MONTHLY SUMMARY - CHEMICAL DEVELOPMENT
JULY 1974

AT Piscataway
 AT Piscataway

DATE July 24, 1974

COPY TO

I. ORGANICSA. Parahydroxybenzoic Acid (I. Cooper, J. DeGaetano)

The Pilot Plant development of the parahydroxybenzoic acid process was concluded with two "standard" batch runs incorporating controlled incremental carboxylation with no subsequent isomerization period. To minimize air contact, evacuation or nitrogen purging techniques were used throughout all steps; no interruptions were permitted until centrifugation of the precipitated acid. To facilitate the work-up procedure and minimize solubility losses, the carboxylated material was dissolved in one-half the amount of water previously used in standard batches. Results of these runs are summarized below:

BATCH NO.	CARBOXYLATION CONDITIONS			PRODUCT (% PARA)	PILOT PLANT YIELDS (%)	
	TEMP. (°C)	INCREMENT	INTERVAL		ON PHENATE	ON CONSUMED PHENOL
74-27	250-255	4 lbs.	7-8 min.	100.0 ⁽¹⁾	52.6	85.0
74-28	250-255	2 lbs.	7-8 min.	99.9+ ⁽²⁾	51.8	72.5

(1) 74-27 - neutralized aqueous layer extracted with 3 x 160 lbs. toluene; para acid precipitated at 10°C; entire batch dried in vacuum oven; APHA 40.

(2) 74-28 - neutralized aqueous layer extracted with 4 x 120 lbs. toluene; para acid precipitated at 20-25°C; 10% of batch dried in forced air oven resulting in some loss of product; APHA < 10.

B. Calcium Loss of Dry Agent (L. Schinasi, G. Kagan, I. Fraser)

A Research Report on Calcium Loss of Dry Agent was issued summarizing the successful preparation of a functional stable dispersion of calcium naphthenate-calcium hydroxide. This stability was achieved with the aid of Nuvis HS as bodying agent and use of an Eppenbach homo-mixer for high shear and grinding action. A stable dispersion of calcium hydroxide alone, was also found to be functional. An ICDS is presently being written for these preparations.

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July 24, 1974

C. Foamacure 142 (L. Schinasi)

A plant demonstration run for the new Foamacure 142 process was made on July 17, 1974, giving 98.6% yield of product and affording 13,138 pounds of material which was shipped to customers. This procedure utilized a 7500 RPM in-line Eppenbach mixer. Initial anti-foaming activity was found to be acceptable in PVA and acrylic paint systems prior to shipment. Longer term shelf stability studies of this commercial material are in progress.

D. 2,4 Dichlorobenzoic Acid (L. Schinasi)

Fords Plant 2,4-dichlorobenzoic acid, which did not meet S & C Electric's particle size requirements necessary for pelletizing, was converted to an acceptable form by compaction in a Chilsonator followed by grinding in a Fitzmill. This work was done at the Fitzpatrick Company facilities in South Plainfield with TOP R & D personnel in attendance. Since capital requirements for the purchase of a new Chilsonator and Fitzmill are excessive relative to the potential business, it was recommended that the Garfield Chilsonator and Fitzmill be used when free from use in sodium benzoate manufacture. Based on through-puts obtained during Pilot Plant trials it would require 20-40 working hours to process the 22,000 pounds inventory of 2,4-dichlorobenzoic acid through this equipment.

E. 2,4-Dichlorobenzoyl Chloride

A Fords Plant campaign involving the manufacture of 2,4-dichlorobenzoyl chloride verified the laboratory process for the ferric chloride catalyzed partial hydrolysis of 2,4-dichlorobenzotrichloride. An average yield of 92.7% (laboratory yield 94.0%) for 11 runs was obtained. The purity of the Fords material by G.C. was 98% (97.0 minimum specification) and had a congealing point of $> 20^{\circ}\text{C}$ (16.5°C minimum specification).

F. Lubricants
Special DTDA (O. Fuchs)

A one gallon sample of specially prepared DTDA (D042-163) was sent to the Lubricants Laboratory for evaluation. The method of preparation was the standard route except that the excess alcohol was stripped at 250°C and 0.8 mm Hg absolute. The final product assayed 99.86% DTDA with 0.05% alcohol.

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II. POLYMERS

A. Plasticizers

1. AGS Acid (O. Fuchs, J. McBroom, E. Szabo)

Functional evaluation of the di-2-ethylhexyl ester of AGS Acid showed this DOA replacement candidate to have low temperature and volatility characteristics similar to DOA. However, the poor color and heat stability preclude its use in clear PVC which is a major outlet of DOA. Under severe shortage conditions TOP could find use for this product in some dark compounds. Analytical findings of AGS Acid show it to be a mixture of adipic, glutaric, succinic acids (15.1:60.6:23.9) with significant quantities of metals present including Cu (709 ppm), Na (842 ppm), Fe (37 ppm), Ca (59 ppm) and others in smaller amounts. Another attempt to react this directly as a 25% replacement of adipic acid in Nuoplaz 6186, again was not successful. A repeat of this same experiment, but using a synthetic blend of the AGS component acids (thus excluding the metal contaminants), was essentially successful synthetically and the resulting Nuoplaz 6186 is presently being evaluated by the Flemington Applications Laboratory. A very dark amber DTDA was obtained when AGS Acid was used on a 100% basis to make this diester, and it will be evaluated in lubricant applications. If successful here, significant quantities of adipic acid could be released for more critical uses (e.g., Polyester VIII).

2. Phthalic Anhydride Lite Boilers (J. DeGaetano, L. Gross)

Functional evaluation of the 2-ethylhexyl ester-diester (D-057-10) of Phthalic Anhydride Lite Boilers (68:28 mixture of benzoic acid: phthalic anhydride) showed it to be useful as a partial replacement for Nuoplaz 1537 (up to 30%) in the GAF wear layer formulation. Preliminary results on this ester-diester as a primary plasticizer for suspension resin has shown good dry blend time, heat stability and melt viscosity. An additional one gallon sample is being prepared in the laboratory for further work on compatibility and volatility. Testing will include evaluation as Nuoplaz 1538 and Nuoplaz 1046 extenders.

B. Plasticizer Expansion (L. Schinasi, S. Cinco)

A survey of the existing pollution control facilities at the Chestertown Plant was made. This was done in conjunction with intended phthalate ester plant expansion. In addition, recommendations for an R & D pollution control program were included in this report. Pilot falling film evaporation (FFE) stripping tests on Nuoplaz 6906, 1537, and DTDP

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were completed at Artisan Industries, Waltham, Massachusetts. Test samples of all three products are currently being analyzed. Stripped DOP, DTDP and Nuoplaz 1537 samples from Buflovak FFE tests were filtered and rechecked for color. DOP and DTDP samples showed a 15 APHA color increase over the initial feed color of 10 APHA. The Nuoplaz 1537 showed a 100 APHA increase over the 400 APHA feed; however, neutralization with sodium hydroxide and peroxide treatment gave a color of 70 APHA (100 maximum specification).

C. Stearates (S. Cinco, I. Cooper, M. Ceprini, G. Cohen)

A meeting on spray chilling technology and equipment was held at Nichols Engineering (Belle Mead, New Jersey) with Chemical Development personnel in attendance. Particle size limitations were pointed out when using an atomizer system, and that use of a 2-fluid nozzle would probably improve the likelihood of obtaining finer particles. Efforts are underway to modify the Pilot Plant spray chilling apparatus to evaluate 2-fluid nozzle technology. A previously pilot plant spray-chilled zinc stearate (Run 74-6) with a screen analysis of 45.0% through 325 mesh, was jet-milled to give 97.5% through 325 mesh. This result demonstrates the potential feasibility of a combined spray chilling-jet milling approach to obtaining fine particle stearates. Samples of production, competitive and pilot plant spray chilled zinc stearates have been submitted for Coulter Counter particle size determinations.

D. Alkyltin Oxides (L. Schinasi, O. Fuchs)

Projected processes for the self-manufacture of alkyltin oxides by the Grignard and Direct Routes were issued so that Process Engineering could determine capital expenditure requirements. The most attractive process would be the one whereby both the butyl and methyltin products are prepared from the respective chlorides by the Direct Method; no recovery and recycling of sodium halide and no intermediate alkyl halide (iodide or bromide) preparation would be required.


I. Huppert

IH:dab

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INTER-OFFICE MEMO **TENNECO CHEMICALS, INC.**

TO Dr. R. T. Gottesman AT Piscataway DATE July 26, 1974
FROM Mr. H. R. Johnson AT Piscataway COPY TO
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Methods Development (N. Conzo)

A procedure was developed for the analysis of tridecyl alcohol as a control method for the use of this material in esters and tin stabilizers (issued as Procedure GC-810).

H. R. Johnson (ec)
H. R. Johnson

HRJ/ec

INTER-OFFICE MEMO

TENNECO CHEMICALS, INC.

TO Dr. R. T. Gottesman
 FROM Mr. R. S. Miller
 SUBJECT MONTHLY REPORT - JULY 1974

AT Piscataway
 AT Piscataway

DATE July 25, 1974

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PLASTICS INDUSTRYPVC Resins

1. VCM Compliance (J. C. Fisher, M. L. Feldman, D. Goodman, M. Koral, P. J. Patel, M. K. Rosen, R. J. Stanaback)

Laboratory techniques to remove VCM from dispersion resin at lower temperatures (i.e., 45-60°C) have resulted in low and no detectable VCM resin. However, these techniques provide "sloppy" high moisture content (>28%) filtrates. The most favorable low temperature VCM removal approaches continue to be scaled up to the pilot plant so that sufficient resin can be prepared to test plastisol rheology.

Pilot plant runs verifying post-polymerization vinyl acetate add back for removal of VCM from copolymer have been made prior to a Burlington plant trial.

Contacts have been made with the compound plant at Burlington and the calendered film and sheet plant at Nixon to exploit our low VCM content VCM resin technology by attempting to patent the fabrication, use and products made from low or no VCM content PVC.

2. Pasadena PVC Process, Activated Carbon Adsorption (J. C. Fisher, P. Mango, P. J. Patel)

* Pilot plant studies on the use of a carbon bed for the adsorption of VCM vapors are in progress. The major results to date are outlined below:

- (a) Adsorption of recovered VCM from a carrier gas results in a 12-13% reduced bed capacity.
- (b) There is no difference in bed capacity (lb VCM adsorbed/lb carbon/cycle) when the VCM is carried by air or nitrogen.

- (c) Higher bed temperatures significantly reduce bed capacity.

<u>Temp. (°F)</u>	<u>Bed Capacity (%)</u>
70	18.8
140	8.4
165	5.6

- (d) Linear gas velocity through the carbon bed (range of 10-70 ft/min) has little effect on bed capacity.

- (e) The carbon bed effectively removes VCM over a 10-100% concentration range in the carrier gas.

A definition of the effect of regeneration steam quality on the bed life (number of cycles before carbon must be replaced) is in progress. The effect of virgin versus recovered VCM adsorption on carbon bed life is also being defined.

Alternate regeneration techniques, e.g., standard steam desorption followed by nitrogen drying, are currently being studied.

3. OC Coating of Glass-Lined PVC Reactors (J. C. Fisher, D. Goodman
M. K. Rosen, R. J. Stanaback)

The possible benefit of applying the Shin-Etsu OC coating to a glass-lined reactor to minimize polymer wall build-up has been evaluated in the laboratory and pilot plant. The laboratory results were inconclusive since there was no build-up on either coated or uncoated bottles or on coated or uncoated steel coupons placed in the bottles.

Initial pilot plant trials showed a possible improvement with the OC coating. Subsequent evaluations, however, do not indicate any significant reduction in the adhesion of polymer scale to either glass surfaces or exposed steel areas.

4. Copolymer Emergency Shortstop (J. C. Fisher, M. K. Rosen)

Thiostop N (dimethyl - dithiocarbamate) has been recommended to production as an emergency shortstop for copolymer polymerization. A production trial has been scheduled.

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