KM-70-1 UTILIZATION OF LOW COST CHAMBERS WORKS LEAD DROSSES By: J. Jackson 2/69 - 12/69

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E. I. DU PONT DE NEMOURS & COMPANY
256 VANDERPOOL STREET
NEWARK, NEW JERSEY

KN-70-1

# NEWARK PLANT
# PIGMENT COLOR RESEARCH REPORT

## UTILIZATION OF LOW COST CHAMBERS WORKS LEAD DROSSES

Period Covered February, 1969 - December, 1969 (Part Time)

FILE: 211

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NEWARK PLANT

PIGMENT COLORS RESEARCH REPORT

SUBJECT: UTILIZATION OF LOW COST CHAMBERS WORKS LEAD DROSSES

PERIOD COVERED: February, 1969 - December, 1969 (Part Time)

SUBMITTED BY: J. JACKSON DATE SUBMITTED: 12/15/69

APPROVED BY: W. S. STRUVE DATE RELEASED: 1/30/70

ABSTRACT

This report summarizes a brief review of the suitability of Reverbatory Furnace Fume Scrubber Solids available from Chambers Works operations for the manufacture of chrome yellows.

In the opinion of the writer, the lead nitrate made from this material offers very considerable promise as a lower cost route to a substantial portion of our N-41 requirements.

Maximum savings per year would be $78,750 assuming a 7¢/lb. spread between Orchem and purchased lead price. Investment and operating costs would alter this figure.

TABLE OF CONTENTS

## 1. INTRODUCTION

The availability of 2 to 3,000,000 lbs./yr.* lead of low cost, by product, lead residues from tetraethyl lead manufacture at the Chambers Works has repeatedly given rise to inquiries as to its potential use in the manufacture of chrome yellows.

The presence of large amounts of $Cl^-$ ($PbOCl_2$; $PbCl_2$; NaCl) has complicated the utilization of this material as a raw material for lead pigment manufacture, and its use has never been adopted.

A more complete discussion of the properties of the bulk of this material is given in my memo "Chambers Works Lead Dross", 3/17/69 (Ref. #3 - copy attached). In this memorandum, I summarized my thoughts on possible means of converting this material to a more suitable form.

Further chemical description of one source of this lead dross, "Accelator Concentrate" is given in J. R. Day's letter to me of 3/25/69 (Ref. #4 - copy attached).

A review of the situation with J. R. Day of Orchem led to the conclusion that a cleaner source of lead (lower insoluble $Cl^-$, Carbon residues, etc.) might be of more interest to the Pigments Department. The Orchem material known as "Reverberatory Furnace Fume Scrubber Solids" was considered to be of such a character. Approximately 1.26 million lbs./year lead basis are available from this source (Ref. #5, 6 - copies attached).

The basic value of these residues to Orchem is that of the lead content equivalent, less toll charges for smelting the material. At the time of this report, this represented about 5 to 6¢/lb. During this period, Pigments Department was paying approximately 13-14¢/lb. of lead. The spread between these values would determine the maximum allowable costs to cover Orchem's and Pigments' required investment and manufacturing costs to recover and convert this material to a suitable alternative to Pigments ($Pb(NO_3)_2$ solution (n-41). Orchem has supplied us a transfer price of $.06/lb. Pb in their letter of 7/31/69 (Ref. #6 - copy attached).

## II. SUMMARY AND CONCLUSIONS

1. A possible source of 1-1/4 million pounds of lead equivalent (substantially in the form of $2PbCO_3.Pb(OH)_2$ is available from Orchem's Reverberatory Furnace Fume Scrubber Solids at $.06/lb. Pb.

2. This material has been converted to $Pb(NO_3)_2$ by solution in hot concentrated nitric acid, adjustment of pH and filtration to remove excessive amount of $Fe^{++}$, $Fe^{+3}$.

3. This lead nitrate was converted in a 100% form and in 50% dilution with regular Pigments Department $Pb(NO_3)_2$ (-41) to a Y-758-D type primrose yellow.

4. The pigments obtained were satisfactory in yield, very close in masstone, skindown, tinting strength, and Fadeometer lightfastness.

*Ref. #7 - Received after report written indicates a potential of 4-6 million lbs./yr.

## III. RECOMMENDATIONS

In the writer's opinion, this work should be extended in cooperation with Orchem to determine (1) the suitability of additional samples of these solids, (2) the quantitative conversion of the samples to soluble lead nitrate, and (3) the economics versus Pigments' routine manufacture of N-41 solution.

## IV. PATENT STATUS

In the writer's opinion, nothing of a patentable nature was developed during these studies. Orchem's considerations may be different from ours.

## V. EXPERIMENTAL

### A. Conversions to $Pb(NO)_2$

J. R. Day of Orchem supplied two samples of "C" Furnace Fume Scrubber Solids (Ref. #5):

1. Dry sample CWNB 2794-178 440.5 grs.
   5/26/69 .33 % $Cl^-$
   70 % Pb dry basis

2. Wet sample CWNB 2794-179 1073.8 grs.
   5/28/69 44 % $H_2O$
   1.7 % $Cl^-$
   70% Pb Dry basis

These samples had been collected and washed to remove the bulk of water soluble $Cl^-$. Orchem X-ray data suggested they are essentially $2PbCO_3.Pb(OH)_2$ plus $SiO_2$.

#### Work Up of Samples

Sample A. The samples were attacked with $HNO_3$ on the following basis:

Calc. # Pb in $2PbCO_3.Pb(OH)_2 = \frac{621}{775.67} = 80\%$ Pb

Assume 6 mols $HNO_3$ will dissolve 1 mol $2PbCO_3.Pb(OH)_2$
Weight of sample $\frac{440.5}{775.7}$ = .567 mol basic lead carbonate - assuming all sample is $2PbCO_3.Pb(OH)_2$

Calc. $HNO_3$ = Use .567 x 6 x 63.02 = 214.5 grs. 100% $HNO_3$

$= \frac{214.5}{.7} \times \frac{70\% \text{ Pb}}{80\% \text{ Pb}} = 268$ gr. 70% $HNO_3$

Calc. yield $Pb(NO_3)_2$ would be:

$440.5 \times 70\% \text{ Pb} \times \frac{331}{207} = 492$ grs.

**Procedure:** To 1250 cc $H_2O$
Add 268 gr. 70% $HNO_3$
Heat to 140°F. - Add Sample A slowly
Temp. rose to 165°F.
pH = .6
Heat to 195-200°F. - Held 1 hr.
Dilute with 250 cc $H_2O$
Filter - Wash 300 cc $H_2O$
Save solids = 129 grs. Dry Wt! (Very high - does not fit analysis)
Save filtrate and wash water
Total filtrate = 2169 grs.
Be' = 23.9 Sp.gr. = 1.1973 gr/cc = .2297

**Assume Reg. N-41 sp. gr. = 416 gr. $(Pb(NO_3)_2$ vs Calc. 492 gr.**
**Actual analysis - solution ex sample A contained 18.34% $Pb(NO_3)_2$.**
**= 397 gr. vs calc. 492**

**Conclusion:** Amount $HNO_3$ used inadequate for complete solution of Pb in this dry sample.

$$\underline{\text{Sample B}} \quad \frac{1073.8 \text{ gr.} \times 56\% \text{ solids}}{775.67} = .775 \text{ mols } 2PbCO_3 \cdot Pb(OH)_2$$

$$\text{Calc. } HNO_3 = .776 \times 6 \times 63.02 \times \frac{\frac{70\% \text{ Pb}}{80\% \text{ Pb}}}{.7} = 366 \text{ gr } HNO_3 \ (70\%)$$

$$\text{Calc. } Pb(NO_3)_2 = \frac{1073.8 \times .56 \times .7 \times 331}{207} = 674 \text{ gr } (Pb(NO_3)_2$$

**Procedure:** To 1300 cc $H_2O$
Add 366 gr 70% $HNO_3$
Add presscake slowly at 130°F - little temp. rise
Heat to 200°F. - Hold 1 hr.
pH 3.85 after 1 hr.
Add additional 20 cc 70% $HNO_3$ - pH 3.5
Add additional 10 cc 70% $HNO_3$ - pH 1.6
Dilute with 200 cc $H_2O$
Filtered - washed
Save total filtrate - 3159 gr.
Weight of dry residue = 190 gr! (High!)

**Assume N-41 Be'** sp.gr. = 1.2447 gr./cc
Yield as calc. = 718 gr.
**Chemical Determination** $Pb(NO_3)_2$ = 23.05%
Yield = 730 grs.
**versus calc. yield on assumption of 70% Pb at 56% solids = 674 grs.**

**Purification of Sample "B"**
To filtrate of B add 82 cc 1% NaOH
pH changed from 1.6 - 2.9
$Fe(OH)_3$ formed
Supernatant liquid showed no test for $Fe^{+3}$ with $NH_4$ SCN
Filtered - recovered 3050 gr. solution
Chemical analysis 22.47% and iron free.

Discussion: It is obvious that the composition is not quite that assumed $2PbCO_3.Pb(OH)_2$ since $HNO_3$ requirements were not as calculated. Moreover, soluble lead nitrate recovered was very high since there was considerable insolubles remaining.

TESTING OF B - PURIFIED LEAD NITRATE

| | A-Control 100% N41 | B 50% Orchem B Purified 50% N41 | C 100% Orchem B Purified |
|---|---|---|---|
| $Pb(NO_3)_2$ equiv. | 165.5 gr. | 165.5 | 165.5 |
| N41 | 537 gr.soln. | 263.5 | - |
| Orchem (B) Purified | - | 367.5 | 740.0 |
| In Total | 1345 cc $H_2O$/80°F | x | x |
| Adjust to pH | 4.1 | x | x |
| Add - stir 1 min. | | | |
| $Na_2CO_3$ | 25 gr/100cc$H_2O$ | x | x |
| Add in 40 seconds | solution | | |
| $Na_2Cr_2O_7.2H_2O$ (N-18) | 54 gr. | x | x |
| $Na_2SO_3$ (N108) | 5.54 gr. | x | x |
| $H_2SO_4$ (100% N-27) | 3.31 gr. | x | x |
| $Na_2F_2$ (N-518) | 1.45 gr. | x | x |
| $Al_2(SO_4)_3.18H_2O$ (N-15) | 4.76 gr. | x | x |
| Dissolved in Total | 1345 cc/80° | x | x |
| pH | 1.85 | x | x |
| Stir 8 minutes | | | |
| pH | 4.35 | 4.2 | 4.2 |
| Add-stir 1 minute between additions | | | |
| $Na_2SO_4$ | 5 gr/20cc | x | x |
| $Na_2CO_3$ | 4 gr/12cc | x | x |
| $Na_4P_2O_7$ (N-479) | 2 gr/100cc | x | x |
| pH | 6.7 | 6.5 | 6.65 |
| Heat to 180°F. - Hold 20 minutes. | | | |
| Add - Stir 1 minute between | | | |
| $MnSO_4.H_2O$ (N-336) | 1 gr/50cc | x | x |
| $Al_2(SO_4)_3.18H_2O$ | 17 gr/68cc | x | x |
| $Na_4P_2O_7$. | 2 gr/100cc | x | x |
| $Na_2CO_3$ 1 gr/4cc to pH 5.1 | | | |
| Filter - wash to 2500 ohm/cm² | | | |
| Dry 180° 16 hrs. | | | |
| Bake 265° 2 hrs. | | | |
| Pigment Yield | 164.9 gr. | 164.1 | 166.1 |

Tested colors by rubout and found all to be similar in color and Fadeometer lightfastness.

VI. REFERENCES - Copies Attached


1. Utilization Low Cost Chambers Works Lead JJ 2/28/69
2. RAH - RJL Utilization of Low Cost Chambers Works Lead 3/5/69
3. Chambers Works Lead Dross JJ 3/17/69
4. J.R.Day - JJ Composition-Accelerator Concentrate 3/25/69
5. J.R.Day - JJ Chambers Works Reverberatory Furnace Fume Scrubber Solids 6/9/69
6. J.R.Day - JJ Transfer Price of Reverberatory Furnace Fume Scrubber Solids 7/31/69
7. J.R.Day - JJ Accelator Concentrate as a Lead Source 1/19/70


dc

CC: M.Hunt/E.Gonick, Pigts.,Wilm.
W.S.Struve/A.A.Brizzolara
R.H.Zabel, Pigts., Wilm.
W.J.McClure/R.A.Hageman
R.E.Roberts, Engr., Louviers
J.Jackson

Newark, New Jersey
February 28, 1969

UTILIZATION OF LOW COST CHAMBERS WORKS LEAD

The availability of 30 - 40,000 lbs. of low cost lead per day at the Chambers Works has repeatedly sparked inquiries as to its potential use in the manufacture of chrome yellows.

It is my understanding that this material is valued at approximately 5 cents/lb. lead versus our approximate cost of 13-14 cents/lb. (R.E.Roberts).

In the past, consideration has been given to the conversion of this type material and other $Cl^-$-containing lead sources to satisfactory N-41 (lead nitrate solution) which can be utilized to make our standard lead containing colors.

The presence of considerable quantities of $Cl^-$ ($PbCl_2$ ?) makes this procedure difficult, and relatively costly, and it has never been adopted.

I propose that thought be given to utilization of this raw material as a source of lead nitrate for low cost high volume medium yellow to be used in traffic paint and, possibly, comic strip inks. These outlets are presently not available to us because of the competitive pricing situation.

I believe that there is a good chance that chloride impurities could be tolerated in pigment for traffic paint since its effect on particle size and color would be less difficult to overcome than in the case of our standard pigments. (Halogens are utilized in the chrome solutions to make these pigments.)

I have assumed, in this suggestion, the absence of metals other than lead, and the availability of suitable equipment for manufacture. The latter point may present problems, but I believe that the idea is worthy of consideration by all concerned.

Julius Jackson

JULIUS JACKSON
RESEARCH ASSOCIATE

dc

(2)

CC: W. J. Mc Clure
W. S. Struve
A. A. Brizzolara

JJ
BHH
PJM

THIS COPY FOR

Newark, New Jersey
March 5, 1969

DR. R. J. LOMBARDO
Pigments - Wilm.

UTILIZATION OF LOW COST CHAMBERS WORKS LEAD *

Utilization of Orchem's low cost lead residue for making traffic paint Chrome Yellows is not economically attractive because (1) the Newark plant will have no excess inorganic capacity until at least 1972, (2) these products will be less profitable than our current Chrome Yellow line.

Traffic paint yellows sell for approximately 12¢ less than market price. The use of this scrap lead would lower our ingredient cost about 5¢ per pound. It is therefore more profitable to make the high quality yellows.

ORIGINAL SIGNED
BY
R. A. HAGEMAN

R. A. HAGEMAN
ASSISTANT PLANT MANAGER

RAH:mkb

*Reference J. Jackson's suggestion 2/28/69.

H. Pester Calc. lower Return for a low Cost Pb than Zn Cro4
assuming Pb at 5¢/lb

(3)

CC: W.S.Murray, Orchem, Chambers Works
C.E.Dailey, " " "
H.Day, " " "
J.Day, " " "
R.E.Roberts, Engr., Louviers
W.J.McClure/R.A.Hageman, Newark
M.Hunt/E.Gonick, Pigts., Wilm.
W.S.Struve/A.A.Brizzolara, Newark
J.Jackson

Newark, New Jersey
March 17, 1969

CONFIDENTIAL

CHAMBERS WORKS LEAD DROSS

Ref: JJ - Utilization Low Cost Chambers Works Lead - 2/28/69
RAH-RJL " " " " " " - 3/5/69

On 3/12/69, H. Day and J. Day of Orchem-Chambers Works called me to discuss possible utilization of a lead containing residue from the manufacture of tetraethyl lead. The following facts were ascertained.

Supply

1. 2-3,000,000 lbs. Pb content per year available on a continuing basis. This represents a minimum of 14% and a maximum of 21% of Newark's 1968 lead requirements.

Chemical and Physical Characteristics

1. Highly particulate material in the form of a sludge containing approximately 50% water.

Solids contain silver
lead
carbonaceous material
lead monoxide
lead sulfide and sulfate equivalent to .5% S
basic lead carbonate
lead oxychloride
lead alkyls

| | |
|---|---|
| Cu compounds | .3% Cu |
| Bi " | .3% Bi |
| Fe " | .3% Fe |
| Magnesium hydroxide | 3-4% |
| Aluminum " | 1-2% |

The presence of lead alkyls would necessitate some processing on the part of Orchem in order to insure safety in handling this material.

I outlined, in a general manner, our manufacturing scheme for conversion of lead to lead nitrate, and spelled out present purification schemes. In addition, I suggested that a review of my KN report (51-44 - "Examination of Lead Bearing Residues for Conversion to Lead Nitrate") might be of some use.

In reviewing this situation, it appears to me that a possible approach to utilize this material would involve a scheme as follows:

Filtration

1. Slurry (a) filter with filter aid if necessary,
   (b) wash to remove bulk of halogen,
   (c) dry.

2. Treat in Furnace - Feed to melting furnace under oxidizing conditions:

   (a) to slag off Mg and Al possibly as silicates,
   (b) to oxidize lead alkyls,
   (c) to oxidize lead sulfide to $PbSO_4$.

   Under reducing conditions:

   (a) Might be needed to convert $PbSO_4$ to Pb if sufficient amount formed.

3. Dissolve in Nitric Acid

This impure $Pb/PbO/PbSO_4$ could then be dissolved in nitric acid, treated with scrap iron to reduce Ag, Cu, Bi to metallic state (for recovery of metallic values) and filtered.

4. Subsequent $Pb(NO_3)_2$ solution could probably be purified of iron by oxidation to $Fe^{+3}$, adjustment of Ph and filtration.

Such a $Pb(NO_3)_2$ even if it contained small amounts of(1% $Cl^-$ / $Pb(NO_3)_2$) might be convertible to satisfactory medium yellow.

The major question would appear to be one of economics. If the value to Pigments Department of pure Pb is $.13/lb. and recovery value of sludge to Orchem is $.05/lb. of lead* only $.08/lb. is available for these operations. This represents $240,000 per year for additional cost of processing and return on needed investment.

Julius Jackson

JULIUS JACKSON
RESEARCH DIVISION

*These approximate figures are based on a high spot value for lead content supplied by R. E. Roberts. Other considerations involving Orchem's processing might lower this figure.

JJ:dc

E. I. du Pont de Nemours & Co., Inc.
Chambers Works
Deepwater, New Jersey 08023

V. R. Burka, Orchem, Wilm.
C. H. Dailey, T.E.L. Office
[illegible], "Freon" Office
R. L. Smith, Adm. Bldg.
[illegible], Adm. Bldg.
[illegible], Adm. Bldg.

March 28, 1969

[illegible] Jackson
Engineering Department
Newark, New Jersey

[illegible] - ACCELATOR CONCENTRATE

The possibility of your plant using our Accelator concentrate as a source of lead for lead chromate manufacture is being explored. During our recent phone conversation on this subject, you requested the attached composition data. We have already started to look more closely at the chloride content and the effectiveness of reslurrying to remove it.

XP

172-2288

J. R. Day
Process Department
Tetra Ethyl Lead Office

JRD:mrw
Attachment

## COMPOSITION - ACCELATOR CONCENTRATE

| | Range | Average, % | No. of Samples |
|---|---|---|---|
| Total Lead | 43.3-81.5 | 64.4 | 25 |
| Free | 2.6-28.2 | 19.3 | 10 |
| Combined[a] | 30.8-56.1 | 39.8 | 10 |
| Cl | - | (c) | - |
| Fe | - | 0.3 | 1 |
| Si | - | (d) | - |
| Insolubles[b] | 9.6-37.2 | 22.4 | 4 |
| $SO_4^{=}$, as S | - | 0.55 | 1 |
| $S^{=}$, as S | - | 0.11 | 1 |
| Mg as $Mg(OH)_2$ | 3.5- 3.8 | 3.6 | 2 |
| Al | - | 1.6 | 1 |
| Bi | - | 0.026 | 1 |

Notes:

(a) Known forms include lead sulfate, lead sulfide, lead oxide, lead oxychlorides, basic lead carbonate, and lead alkyls - the latter are about 10% by weight of the total solids.

(b) Mostly graphite.

(c) Will be determined.

(d) Unknown but small - estimate <0.1%.

J. R. Day
March 25, 1969
cmc

(5) Alternative source different composition

E. I. du Pont de Nemours & Co., Inc.
Chambers Works
Deepwater, New Jersey 08023

T. J. R. Stephens, Adm. Bldg.
W. S. Murray, "Freon" Office

June 9, 1969

Julius Jackson
Pigments Department
Research Division
Newark, New Jersey

CHAMBERS WORKS REVERBERATORY FURNACE
FUME SCRUBBER SOLIDS

As agreed in our phone conversation on May 19 we are sending under separate cover two samples of our reverberatory furnace fume scrubber solids. Both samples have been filtered, reslurried in distilled water, filtered and given three distilled water rinses. One sample has been dried and the other is as removed from the filter. Analyses are as follows:

| | % $H_2O$ | % Cl | Wt., g. |
|---|---|---|---|
| Dry Sample | - | 0.33 | 440 |
| Wet Sample | 44* | 1.7* | 1073 |

*On dry basis.

J. R. Day

J. R. Day
Process Department
Tetra Ethyl Lead Area

JRD:cmc

For evaluation and results see attached and June 2669 Monthly Summary JJ

DUP050081848

#6

Copy MH/EG
WSS

E. I. du Pont de Nemours & Co., Inc.
Chambers Works
Deepwater, New Jersey 08023

V. R. Burka, Orchem, Wilm.
G. N. Ross, Orchem, Wilm.
W. J. McClure, Pigments, Newark
J. D. Moomaw, Pigments, Wilm.
W. W. Cogdill, T.E.L. Office
C. E. Dailey, T.E.L. Office
W. S. Murray, "Freon" Office
H. L. Smith, Adm. Bldg.
T. J. R. Stephens, Adm. Bldg.
T. W. Tomkowit, Adm. Bldg.

July 31, 1969

J. Jackson
Pigments Department
Research Division
Newark, New Jersey

TRANSFER PRICE OF REVERBERATORY FURNACE
FUME SCRUBBER SOLIDS

This letter is in answer to your verbal request for a transfer price on our reverberatory furnace fume scrubber solids. We understand that this material may be suitable as a lead source for certain grades of lead chromate pigments and that in order to determine if an additional laboratory program on your part is justified, some idea of the cost of our material is required.

After consulting our Control Department, we propose the following method for determining a transfer price based on the best course of action for DuPont. Orchem will establish the cost of collecting and preparing the material in a suitable form for your use. Pigments would determine the additional costs incurred by handling our solids. The cost of shipping from Chambers to Newark would be added to these two numbers. If the total is less than the cost of new lead, and the likelihood of this being the case seems probable, then the savings could be split equally between the two departments.

As a starting point, we have developed a rough figure of $0.06/lb. lead for preparing the shipment of fume scrubber solids in a wet cake form. This figure considers the present recovery method and purchase of new lead to be a "stand-off", i.e. the recovery costs are equivalent to the value of the lead in these solids. Therefore, our cost of preparing the material

for you includes only the operating cost of the new equipment needed for collecting and concentrating the solids (see attached calculation). Freight costs are estimated at $0.01/lb. load.

The above two figures, along with the additional figure which you develop, should indicate whether or not you might be interested in pursuing this work further. When you have determined this, we would appreciate knowing your thoughts so that we can further refine our estimated cost or seek another course of action.

J. R. Day

J. R. Day
Process Department
Tetra Ethyl Lead Area

H. C. Ravenell

H. C. Ravenell
Control Division
Orchem, Wilmington

JRD:cmc
Attachment

**Attachment**

## COLLECTION OF FUME SCRUBBER SOLIDS

### T.E.L. Area - C.W.

### Operating Cost

Basis: Investment $350,000
Amount of Lead - 1.26MM lb./yr.

| | $ |
|---|---|
| Materials | - |
| Operating Labor | 10,000 |
| Repair Labor | 14,000 |
| Direct Overhead | 6,000 |
| Repairs Material | 10,500 |
| Depreciation | 35,000 |
| Operating Cost | 75,500 |

Operating Cost/lb. Pb = $75,500/1.26 \times 10^6$ =

ca. $0.06/lb. Pb

JRD:cmc
8/1/69

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED

CHAMBERS WORKS
DEEPWATER, NEW JERSEY 08023

WSS
JJ

D. F. McVaugh, Orchem, Wilm.
W. W. Cogdill, T.E.L. Office
C. E. Dailey, T.E.L. Office
W. S. Murray, "Freon" Office
E. J. Roszko, T.E.L. Office
H. L. Smith, Adm. Bldg.
T. W. Tomkowit, Adm. Bldg.
T. J. R. Stephens, Adm. Bldg.

January 19, 1970

J. Jackson
Pigments Department
Research Division
Newark, New Jersey

ACCELATOR CONCENTRATE AS A LEAD SOURCE
FOR CHROMATE PIGMENTS

This letter records the sense of our recent telephone conversation. It is understood that the major reason for the Pigments Department's lack of interest in our reverberatory furnace fume scrubber solids, which are Cl-free, is that this source (estimated at 1.25MM lb. lead/year) would provide too small a portion of the total requirement (around 12MM lb./yr.) to bother with.

You indicated, however, that Accelator concentrate which is available in larger quantities (4-6MM lb. lead/yr.) would be of interest if it could be made Cl-free (previous analytical data have indicated about 4% Cl). In recent high spot tests one of our chemists, R. Moore, has found that the Cl can be removed from Accelator concentrate by dissolving in $HNO_3$ and refluxing to remove the HCl formed. Since your comments were encouraging, we propose to continue work with this material and will send you a $Pb(NO_3)_2$ solution for end-use testing.

J. R. Day
J. R. Day
Process Department
Tetra Ethyl Lead Area

JRD:emc