

Serial No.

KW-50-27

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KREBS PIGMENTS DEPARTMENT
256 VANDERPOOL STREET
NEWARK, NEW JERSEY

NEWARK PLANT
PIGMENT COLOR RESEARCH REPORT

Final Report

PARACHELOR RED, RT-427-D, HIDING POWER

LABORATORY STUDIES

Period Covered

October 1949-January 1950

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PIGMENT COLOR RESEARCH REPORT

Final Report

Title: Parachlor Red, RT-427-D, Hiding Power
Laboratory Studies

Period Covered: Oct. 1949-Jan. 1950

Charge: A-IC-56 (1100-11-56)

M. Fytelson
SUBMITTED BY: M. Fytelson.

DATE SUBMITTED: 8/21/50

A. A. Brizzolara
APPROVED BY: A. A. Brizzolara

DATE ISSUED: 9/13/50

9/13/50

INTRODUCTION

Parachlor Red, RT-427-D, has long been known for its brightness and excellent behavior on exterior exposure. However, its relatively poor hiding power and present higher selling price relative to Fire Toner, RT-396-D, (\$1.05 vs. \$1.00/lb.) have contributed to a gradual decline in sales volume over the past few years. In addition, unfavorable comments on the "browning off" of enamels formulated with RT-427-D and stored in tin cans for long periods of time have been received.

The appearance on the market of Standard Ultramines Duratone Reds and Harmon's Marablaze Reds, identified as blends of precipitated BON pigments with Fire Toner, as cheap durable toluidine substitutes has prompted this investigation. Efforts have been directed towards improving the hiding power of RT-427-D by the use of accessory agents and process modifications. Some attention has been given to the preparation of Fire Toner from purchased intermediate and intermediate of Newark manufacture. Control of the "browning off" on storage has been attempted by the use of acid acceptors.

SUMMARY AND CONCLUSIONS

The substitution of accessory first components, such as ONA, MNA, PNA, and OCPNA in 5-15% quantities for PCONA in the RT-427-D process does not materially improve the hiding power in alkyd systems.

Variations in diazotization acid and procedure, the adjustment of the pH of the color slurry prior to filtration, after-treatment of the color slurry with resinous oil, heat development of the coupled toner prior to filtration, all, do not alter the hiding power noticeably.

No evidence of "browning off" of standard nor of the experimental laboratory products was observed in periods up to 5 months shelf storage. Acid acceptors such as whiting, zinc oxide and magnesia did not affect this property.

The laboratory preparation of Fire Toner from purchased OCPNA and from PNA has been found to yield products of equal brightness and better baking resistance than RT-396-D. Unfavorable economic considerations preclude further work on this problem and the experimental program has been concluded.

DISCUSSION

All process variations concerned with diazo modifications, pH adjustments of color slurry, after treatment with agents, heat development do not seem to alter the hiding power characteristics of RT-427-D.

The isomeric nitro-anilines, when used as accessory first components in 5 and 10 mol % quantities, have no apparent effect on hiding power. Substitution of the isomeric, OCPNA, in 5-15% yields lighter, stronger yellower products with no improvement in hiding.

The substitution of PCONA for OCPNA in the Fire Toner preparation by the RT-427-D procedure yields some interesting products tinctorially but costs based on OCPNA at \$0.655 per pound are still too high. Fire Toner prepared from PNA by the RT-208-D procedure approximates the current standard quite closely. Another possibility is the preparation of OCPNA by aqueous hypochlorite treatment of PNA, followed by conversion to Fire Toner by the RT-427-D process. Material, thus made, was somewhat duller and yellower than the standard.

The following table will summarize some preliminary cost calculations based on current and estimated prices for the basic intermediates.

Code	Ing.	O.P.	Mill	Conditions
Fire Toner	49.10	63.96	83.04	PNA at \$44.50, BN at \$30.10 1200 # batch size.
RT-427-D	48.61	63.47	82.55	9-1-49 Replacement
Fire Toner	59.00	73.86	92.94	OCPNA at $\pm$ \$80.00 from Orchem. 1200 # batch size.
Fire Toner ca	64.00	ca78.86	ca97.94	OCPNA at \$65.50 1200 # batch size.

As can, be readily seen, very little spread is available at a selling price of \$1.00/lb. under these conditions.

A comparison of RT-427-D and Fire Toner by physical means has developed several points of interest. X-ray diffraction patterns show the same degree of crystallinity but the maxima are sufficiently different so that ready identification can be made. It would, however, be difficult to detect the presence of one isomer in the presence of the other. Specific surface data show RT-427-D to have a much larger average particle size than Fire Toner, thus contributing to the lower strength and poorer hiding power of this product.

GLOSSARY

Parachlor Red	RT-427-D	PCONA-BN
Fire Toner	RT-396-D(1)	OCPNA-BN
	RT-208-D(2)	OCPNA-BN
PCONA	para-chlor-ortho-nitraniline	
OCPNA	ortho-chlor-para-nitraniline	
BN	beta-naphthol	
ONA	ortho-nitraniline	
MNA	meta-nitraniline	
PNA	para-nitraniline	
Resinous Oil X-1	N-552	
Duratone Reds	Blends of Mn/or Ni.BON's with Fire Toner	
Marablaze Red	Blends of Mn/BON's with Fire Toner	
Whiting	Ca CO ₃	
Magnesia	Mg O	
(1)	Current standard - purchased	
(2)	Obsolete standard - manufactured	

REFERENCES

N. B. 1194-(53-64) incl.
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