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NEWARK PLANT
PIGMENT COLOR RESEARCH REPORT

Final Report

"LITHOSOL" RED 2B ACID
DIAZOTIZATION STUDY

Period Covered: FEBRUARY 7 - FEBRUARY 18, 1949.

FILE: 222.24

DATE: 3/11/49

KR-49-17

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NEWARK PLANT

PIGMENT COLOR RESEARCH REPORT

Final Report

"LITHOSOL" RED 2B ACID
DIAZOTIZATION STUDY.

CHARGE: 1101-11-32
A-I-32

SUBMITTED BY: John L. Ashby J. L. Ashby DATE SUBMITTED: 3/1/49

APPROVED BY: A. A. Brizzolara 3/11/49 DATE ISSUED: 3/11/49

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INTRODUCTION:

In connection with the recent work on RT-618-D, "Watchung" Red 2B (Red 2B → BON/Ba), a new method of diazotizing "Lithosol" Red 2B Acid was developed. This new method is based on the "DuPont Rubber Red 2B" formula recently obtained from Orchem.

Consistently high yields were obtained in the laboratory by use of this new method which employs lower volume and higher temperature solution and acidification than is currently used at Newark for Red 2B Acid.

Possible application of this new procedure to other Red 2B colors was considered. For example, with RT-428-D (Red 2B → BON/Ca, Sr) the performance yield was only 94.6% of goal yield in #6 building and tended to be even lower in the new #9 building unit. In addition, Red 2B Acid was being used as ±96-97% (Plant Analytical Results) while Orchem analysis indicated ±99% purity.

SUMMARY & CONCLUSIONS:

As a result of this yield difficulty, a very brief laboratory study to compare the efficiency of the RT-428-D type procedure with that of the RT-618-D type was undertaken. The result of this laboratory investigation showed the following:

a) By use of the RT-618-D procedure it is possible to utilize 99% or more of the Red 2B Acid under conditions that can be met in the plant equipment.

b) When the RT-618-D method of diazotization was tested in the RT-428-D formula, a 3% higher pigment yield was obtained in the laboratory.

c) In the RT-428-D formula, the new method gave a s.lighter masstone and a vs bluer tint than the present formula (K-2422).

DETAILED DISCUSSION:

The procedure currently used for diazotizing Red 2B Acid (K-2422) gives conversion of 96-97% of the Red 2B Acid to the diazo when the acid is dumped into the Red 2B Acid sodium nitrite slurry in the laboratory. Under plant conditions where it is necessary to add the acid more slowly, this method gives very erratic results with the conversion to diazo falling as low as 91% for a two minute acid addition.

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Briefly the RT-618-D procedure compares to the present RT-428-D procedure as follows:

For a 1.5 mole coupling, all ingrediant weights as in RT-428-D, (K-2422).

	RT-618-D	RT-618-D	RT-428-D
A - Dissolving volume -	360 gal.		720 gal.
B - Dissolving temperature -	160°F		95°F
C - Add acid in 10-11 minutes to solution at 160°F			Ice to 32-36°F
D - Ice to 32-36°F			Dump in Sodium Nitrite
E - Dump in sodium nitrite*			Dump in acid

*Indications are that the method gives the highest efficiency with very rapid addition of sodium nitrite.

Three diazotizations procedures that seemed suitable for plant use were investigated:

A - Standard procedure now employed in RT-428-D (K-2422).

B - Same procedure as "A" but the order of nitrite and acid addition were reversed.

C - RT-618-D procedure.

Essentially the study consisted of studying various rates of acid addition to diazos formed by these methods.

The investigation was carried out in two parts. In the first part a number of diazos were prepared and percentage conversion of Red 2B Acid to the diazonium compound was determined by titrating the nitrite excess with sulfamic acid to a colorless KI-Starch endpoint.

In order to confirm, by yield, the data obtained by titration and to determine the effect on color of the various procedures, a laboratory strike was made on the RT-428-D formula employing several different diazotization procedures. All coupling volumes, etc., were the same for all strikes.

The data obtained is presented on the next two pages.

Further details may be found in N.B. 1295-9.

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"LITHOSOL" RED 2B DIAZOTIZATION STUDY

LABORATORY DATA

	Time of Acid Addition	% Conversion (by titration)	% Conversion (by Yield) (assuming 4% toner is rosin)
"A" Type (RT-428-D)	Dump	98.6	96.6
	2	91.6	96.2
	10	95.1	-
"B" Type	Dump	96.5	-
	7	96.5	95.2
"C" Type (RT-618-D)	Dump	98.4	96.6
	7	98.7	-
	11	99.45	98.8

Nitrite value by Plant Analytical Laboratory:

(Tentative procedure July 1947)	96.78
" " recheck	97.97
By new Orchem procedure	99.17
By KCR 71	95.8

NOTE: 30 second sodium nitrite addition used in all laboratory diazotizations.

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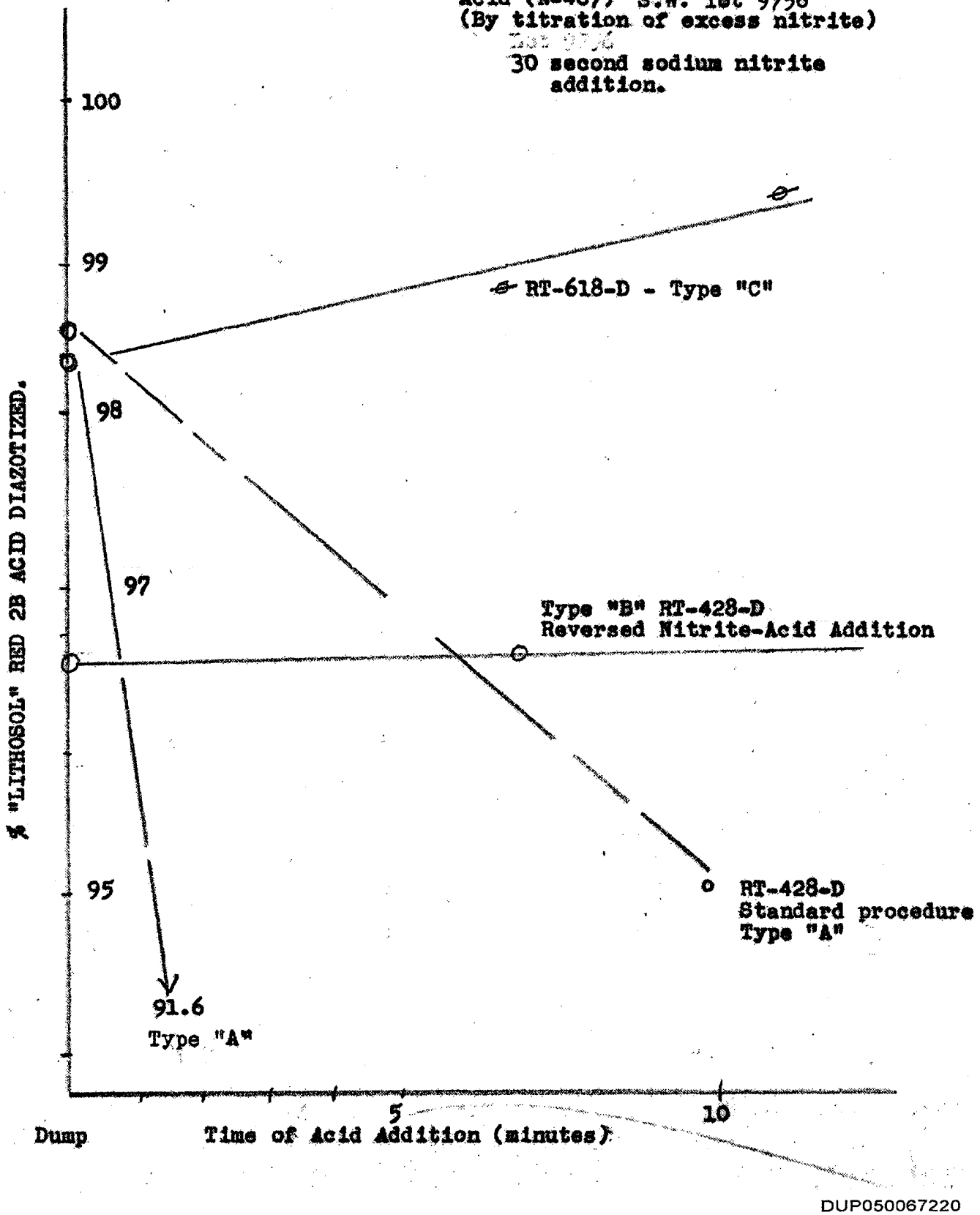

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