Serial No. KN-49-8

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KN-49-8

# NEWARK PLANT
# PIGMENT COLOR RESEARCH REPORT

Final Report

Title: RT-571-D, LABORATORY DEVELOPMENT
5-nitro-2-amino-anisole → "Lithosol" Acid BON, Manganese

Period Covered: FEBRUARY 1946 to MARCH 1948

Charge: A-IIC-180

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SUBMITTED BY: A. D. MILLS DATE SUBMITTED: 1-27-49

APPROVED BY: A. A. BRIZZOLARA 11/14/49 DATE ISSUED: 11-14-49

INTRODUCTION:

A study was undertaken to reduce or eliminate the reactivity in alkyd of the automotive maroon RT-588-D (5-$NO_2$-2-$NH_2$-anisole → "Naphthanil" ASD) formerly known as RT-551-D(A). The problem was approached from two angles, namely (1) a variable study on RT-588-D per se and (2) an attempt to either add some agent or eliminate extraneous materials which might affect the reactivity. The major portion of this work is covered in a report on the Reactivity of RT-551-D but the laboratory development of an additive (RT-571-D) which was effective in reducing reactivity is covered separately herein.

It is known that when "Naphthanils" are dissolved in caustic soda at elevated temperatures, some portion is hydrolyzed to Beta Oxy Naphthoic Acid. Based on this fact some 5-nitro-2-amino-anisole → BON was prepared as the free acid, sodium, and manganese salts. When these were added to RT-588-D in 10% amounts the reactivity was reduced and the thixotropy practically eliminated.

SUMMARY AND CONCLUSIONS:

"Lithosol" Acid BON was substituted for the "Naphthanil" ASD in RT-588-D (K-2292) and laked with manganese sulfate. This product, coded RT-571-D, when added in 10% amounts to RT-588-D reduced the reactivity of the latter considerably.

A variable study was made on RT-571-D with several important results as follows.

1. Elimination of the sodium bicarbonate and use of an all caustic coupling gave very thick slurries and the products were inferior in reducing the reactivity of K-2292.

2. Several other metals were used for laking with all products exhibiting some effectiveness in reducing reactivity and several equal to RT-551-D(D). Because of variations in color this study was not extended at this time.

3. The pH of coupling should not be lower than 6.5 or a brownish type pigment will result.

4. Development is the most important variable studied. A prolonged heating cycle will result in a conversion of the pigment from a dark, blue, weak type to a light, yellow and very strong product. This so-called "flopped" material is absolutely ineffective in reducing the reactivity of RT-588-D.

5. The BON cannot be added to the NASD and co-coupled in any way. All attempts resulted in increased reactivity.

GENERAL DISCUSSION:

In the course of the variable study on RT-571-D all the usual variations were tried and in most cases had no effect or tended to be detrimental. Other BON, manganese pigments as well as other methods of preparation of 5-nitro-2-amino-anisole → BON did not affect the reactivity.

When the effectiveness of the RT-571-D additive was first discovered an attempt to co-couple the NASD and BON was made with no beneficial results. From time to time various modifications of the co-coupling technique were tried but to no avail.

The sodium bicarbonate was eliminated and several variables run on the all caustic type coupling but the slurries were quite heavy and the effect of the products on the reactivity of RT-588-D (K-2292) was not equal to RT-571-D.

Following a "flopped" batch in the plant, the problem was returned to the laboratory for a complete development study. This light type material is a function of both time and temperature of development. It can be obtained at 100°C in 15-30 minutes, at 90°C in 9 hours and at 70°C in over 24 hours. However, if the slurry is seeded with 10% of the "flopped" material the change is greatly accelerated, producing the light material in 5 minutes at 100°C., 20 minutes at 90°C and 5 hours at 70°C. It is believed that developing at 70°C is a safe temperature for plant manufacture. It is undesirable from an operating standpoint to finish the slurry off undeveloped as the pressing cycle (already long) is increased tremendously.

Various other metals were substituted for the manganese with several resulting in effective products but somewhat different in color. At the time no further work was done.

The RT-571-D in presscake form may be added to the RT-588-D finished slurry with satisfactory results but is more costly from an operating standpoint.

EXPERIMENTAL DETAILS:



REFERENCES:

KN-49-6 - Reactivity of RT-551-D.
KN-49-8-10 - Plant and Semi-Works Development of RT-571-D.
DSN-49-10 & 11 - Plant and Semi-Works Development of RT-571-D.