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NEWARK PLANT
PIGMENT COLOR RESEARCH REPORT

Final Report

PREPARATION OF METAL COMPLEXES
OF DIHYDROXY QUINOLINE DYES

Period Covered

SEPTEMBER 1950 - FEBRUARY 1951

FILE:

221

DATE:

March 14, 1951

Serial No. **Ra-51-16**

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Final Report

**PREPARATION OF METAL COMPLEXES
OF DIHYDROXY QUINOLINE DYES**

SEPTEMBER 1950 - FEBRUARY 1951

CHARGE: A-IIC-183

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DATE SUBMITTED: 3-8-51

DATE ISSUED: March 14, 1951

INTRODUCTION:

Green Gold Pigment, YT-562-D, a nickel complex of the para-chlor aniline dihydroxy quinoline coupling, is liked by the trade not only for its clear greenish yellow tint and its "flash" in metallic finishes but particularly for its good lightfastness. The greenish yellow tint blends well with CPC blue and green to produce very lightfast light green tints but does not blend too well with other pigments in the formulation of lightfast reddish yellows or reds. The trade has expressed a desire for a redder tint YT-562-D. This report covers the preparation of samples of metal complexes of azo dyes varying from reddish yellow to bluish red tints.

CONCLUSION:

The following complexes have been prepared in half pound samples, formulated in lacquer and enamel, and placed on exposure:

1. Aniline → Dihydroxyquinoline/Ni complex (using dimethyl aniline)
2. Para-nitraniline → Phenyl-methyl-pyrazolone/DHQ/Ni complex
3. Aniline → DHQ/Ni complex (using diethyl amine)
4. Amino-azobenzene → DHQ/Ni complex
5. Aniline → DHQ/Ni complex (using triethanolamine)
6. Anthranilic Acid → DHQ/Co, Ca complex

The pigments are arranged in order from an intense, reddish yellow tint (1) to a bluish red tint (6). The masstones range from light brown to a dull maroon. A number of the products, because of low opacity, make interesting metallics.

The nickel complex of the Aniline → dihydroxyquinoline coupling is of considerable interest tinctorially. By varying the complexing conditions the tint may be varied from a bright yellow of medium chrome yellow range to an orange, and the hue varied from a dull yellow to a rich brown in metallic finishes. In most cases, there was evidence of incomplete conversion of the dye to the nickel complex. It has been decided to study further the laking conditions of the aniline → DHQ coupling.

SUMMARY:

The purpose of this work was the preparation of large samples of the various complexes selected from the large number prepared at Jackson Laboratory. A great number of metal complexes of azo dyes have been investigated by Dr. Woodward, working with small laboratory couplings, sufficient for rubout evaluation only. What is now YT-562-D was selected from an initial survey of Woodward's work. In a more recent review, the six materials discussed here were selected for more complete evaluation. In the preparation of these samples, Woodward's procedures were followed and fair duplication of his tinctorial properties was obtained, although in some cases bad bleed, poor lightfastness, and low yield indicated incomplete conversion of the dye to the complex. No attempt was made to improve the products by variations in the manufacturing procedure. A tabulation of color properties follows:

DHQ COMPLEXES - COLOR PROPERTIES

<u>Sample</u>	<u>Pigment</u>	<u>Tint</u>	<u>Metallic</u>
YT-562-D	PNA → DHQ/Ni	Greenish yellow	Green (some flash)
1293-49	Aniline → DHQ/Ni (DM Aniline)	Bright reddish yellow	Dull, reddish yellow
1293-45	PNA → PMP/DHQ/Ni	Reddish yellow (redder than above)	Reddish brown (cons. flash)
1293-48	Aniline → DHQ/Ni (D E Amine)	" " "	Golden brown (cons. flash)
1293-50	AAB → DHQ/Ni	Fairly bright orange	Rich brown (cons. flash)
1293-47	Aniline → DHQ/Ni (T E A)	Orange	Rich brown (cons. flash)
1293-46	Anthranilic → DHQ/Co, Ca	Bluish red	Dull maroon (some flash)

REFERENCES:

Notebook 1293 Expts. 45 - 50 inclusive

RLM 51-4

Exposure Series 10211

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