

NEWARK PLANT

PREPARATION OF LIGHT CHROME ORANGES

"SPECIAL REPORT"

FILE: ^{211.2}~~CHROME ORANGES~~

DATE: MAY- 1935

N36977

**THE PREPARATION OF LIGHT CHROME ORANGES
SPECIAL REPORT**

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INTRODUCTION

This report is based on work carried out in April of this year following some manufacturing difficulties on YO-27-D. It will serve to supplement the special report (RRD) of June 28, 1932.

DETAILED REPORT

In connection with some recent difficulties in the preparation of YO-27-D it was necessary to study this process in the plant. The difficulty encountered was that YO-27-D was being obtained either strong and yellow in tint or red in masstone.

Past work on YO-27-D indicated that it consisted of a mixture of approximately equal molecular proportions of PbCrO_4 and PbO.PbCrO_4 . PbCrO_4 of the largest particle size yet obtained is light in masstone and weak vs. YO-27-D, while PbO.PbCrO_4 equal in masstone to YO-27-D is strong and yellow in tint. It is therefore necessary to prepare YO-27-D by a process giving a mixture of PbO.PbCrO_4 and PbCrO_4 . If the operating conditions are such that we match YO-27-D in masstone but have more PbO.PbCrO_4 in the final product we are approaching a product equal in masstone to YO-27-D but about 40% strong and consisting of 100% PbO.PbCrO_4 . If altering the operating conditions results in a product containing less PbO.PbCrO_4 than YO-27-D but remaining equal in masstone, the tint will be red and weak. The most essential factor in a YO-27-D process is therefore the use of quantities of materials and operating conditions which will result in the formation of a pigment slurry containing equal molecular proportions of PbO.PbCrO_4 and PbCrO_4 .

In the preparation of YO-27-D, the lead chromate ratio should be adjusted as discussed above. The ratio of acetic acid to sodium in the process determines the pH and to some extent the chrome excess. YO-27-D is prepared with a very slightly alkaline solution and a very slight chrome excess. To obtain a slight alkaline reaction, there should be very slightly more than one mole of sodium per mole acetic acid. This will also result in a slight chrome excess. As the strike temperature is increased to a boil the pigment becomes darker in masstone and slightly red and weak in tint. If the pigment slurry is boiled after the strike, the strike temperature has little effect. As the ratio of chromate to lead increases, the reverse strike gives a weaker pigment than the direct strike. The strength difference is slight for products close to YO-27-D and is reversed at the YO-30-D depth.

The difficulty in preparing YO-27-D arises from the fact that large particle size PbO.PbCrO_4 is most easily prepared by increasing the alkalinity and this in the YO-27-D process increases the chromate excess and the proportion of PbO.PbCrO_4 , both of which act in the direction of increasing the strength. The method now used for obtaining large particle size PbO.PbCrO_4 is to boil after the strike and to use a very slight precipitant excess. It seems probable that any set of operating conditions resulting in large particle size PbO.PbCrO_4 without destroying the PbCrO_4 present will be satisfactory for the preparation of YO-27-D.

100%

Modified formula for YO-27-D based on lot #42800 etc., replaces formula of 4/7/27.

1270 Dichromate of Soda

Run to strike vat

No temp. or volume adjustment

4906 Lead Oxide T.B.L. }
 890 Acetic Acid in soln. }

Run lead liquor into dichromate as fast as possible; heat to a boil; adjust to faint excess chromate and pH 7.1 - 7.3.

15 Chromate of soda

This is done by adding approximately 10-12 lbs.

20 Dichromate of soda

of sodium chromate and 13-20 lbs. of sodium dichromate. Addition shall be made in small portions and tested carefully for the desired endpoint.

Boil 35 min., do not quench; draw first water after 1-1/2 hours and 3 waters in 2-4 hour intervals, heating each water to 100°F while flooding
 Press, dry at 100°F

6000

ANALYSIS

Basic lead chromate 100%

Type Color: YO-27-D

Pkg: 500# "I" Bbl.

Color Cost Group #0

GR-100-0

60754