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MEMORANDUM REPORT NO. M-512

BLACK "DULUX" ENAMELS

Introduction

Attempts to duplicate a Flint Laboratory enamel on a plant scale yielded a product of poorer jetness. The only difference between these enamels was the resins employed. These resins show very small differences in physical properties. This report shall comprise a summary of the work undertaken at this laboratory.

Summary and Conclusions

Tests on the enamel indicated that the problem resulted owing to a difference in degree of dispersion. Grinding studies holding all variables constant save the resin employed demonstrate that the trouble arises in the grinding process and not in the let down step. Physical properties of the two resins show these to be the same within experimental error. Fractionation studies show a slight preponderance of higher molecular weight material in the laboratory resin. Grinding studies on each fraction to determine dispersion differences will be undertaken.

Details

The degree of dispersion was estimated using the following techniques: optical and election microscope studies, tinting strength, small angle light scattering and centrifugal separation. All these showed a slightly larger quantity of larger size pigment in the plant enamel.

The physical properties measured on each resin were: acid number, hydroxyl number, solids content, infra-red spectra, moisture content and phthalic content. All these were alike within experimental error. Light scattering data showed that

the coarse fraction of the plant resin was composed chiefly of material in the .5 micron range whereas the lab resin had a broader distribution and larger material.

Addition of gelled material to the laboratory resin grind failed to reduce the jetness of the enamel obtained.

Fractionation studies yielded the following results:

1. Extracted with 12% water in H-69,
2. Extracted with 4% water in H-69.
3. Extracted with H-69.
4. Analysis of Residue.

	Lab Resin	Plant Resin
1.	25%	26%
2.	33%	36%
3.	8%	9%
4.	30%	27%
	96%	98%

Experimental Details are found in Notebook 5488

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