

BUSINESS CONFIDENTIAL

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MONTHLY REPORT
(BUSINESS-SUPPORTED PROGRAMS)

TO: Dr. F. E. Bailey, Jr.

FROM: J. J. Brezinski

DATE: December 20, 1967

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R. N. Wheeler

689G13 EXPLORATORY VINYL RESIN SCREENING

Ethylene Content of "O" and "Q" Suspension Resins. A series of vinyl chloride-ethylene copolymer samples of known ethylene content (defined using the Paar bomb technique for chloride content) were employed by Ron Thursack to develop a new calibration curve with the infrared instrument at South Charleston. The study reveals the following:

1. The relationship between absorbance and ethylene content is indeed linear, as was assumed earlier by Dr. H. F. White when the presently used calibration curve was developed (CTP-294-C).
2. The ethylene content as defined using the present calibration curve is inaccurate.
3. The values based on the present calibration curve can be converted to corrected values by multiplying by 1.75.

The fact that the absorbance/ethylene content is linear will permit the conversion of former data based on CTP-294-C to corrected ethylene content by multiplication by a simple conversion factor.

The specimens used by Ron Thursack were forwarded to Jim Hockersmith for use in development of a new calibration curve with the Texas City instrument.

R. A. Thursack, G. H. Potter, J. W. Fields

Ethylene Content of Dispersion Resins. Studies are in progress to define the ethylene content of vinyl chloride-ethylene dispersion resins. The samples of resin with 0, 1, 2 and 4 percent ethylene have been purified by reprecipitation from solvent and extensive washing and Paar bomb analysis run on the pure resin. Plaques from these samples have been submitted for definition of ethylene using infrared measurement; plaques prepared directly from the dispersion resins were also submitted for comparison.

G. H. Potter

RESEARCH AND DEVELOPMENT DEPARTMENT
CHEMICALS AND PLASTICS
UNION CARBIDE CORPORATION

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Food Additive Petition: Vinyl Chloride-Ethylene Copolymers.

The following approximate fundamental relationships were defined on vinyl chloride-ethylene copolymers containing 1.1-1.3 percent ethylene. These approximate relationships, based on intrinsic viscosity measurement and gel permeation chromatographic definition of molecular weight will be used in the planned petition for FDA approval of vinyl chloride-ethylene copolymers..

Number Average Molecular Weight:

$$[\eta] = 7.9 \times 10^{-4} \bar{M}_n^{0.89}$$

Weight Average Molecular Weight:

$$[\eta] = 9.7 \times 10^{-4} \bar{M}_w^{0.80}$$

in which $[\eta]$ = intrinsic viscosity, $\bar{M}_n$ = number average molecular weight and $\bar{M}_w$ = weight average molecular weight.

The information was forwarded to Dr. Watson B. Ackart of the Bound Brook Laboratory.

G. H. Potter

Water Slurry Process - Wire Coating Compounds. Four samples of a vinyl building wire compound, "75°C. THW Formulation" were prepared in 30 pound lots for extrusion trial on wire by Mr. H. J. Pazinski of the Bound Brook Laboratory. The agglomerating agents used include: 5 and 10 PHR of NIAX Polyol 560 and 5 and 10 PHR of ϵ Polycaprolactone (D-5768). The only difficulty encountered in this scale-up (10-gallon autoclave was used) was some build-up on the sides of the container attributed to insufficient or improper agitation. Successful scale-up of the water slurry process to larger equipment would require additional agitation studies.

J. W. Fields

Method for Definition of Iron in Vinyl Chloride Monomer.

A limited study is being conducted to define iron content in vinyl chloride monomer using atomic absorption spectroscopy. A solution of the monomer in tetrahydrofuran was not suitable as a sample because the solvent interferes by causing a reducing flame. The use of an acidic aqueous solution (0.3 % HCl) gave good results; work is continuing.

J. F. Haskin, M. L. Sydenstricker

333A13 CALENDERING, FLOORING AND RECORD PRODUCTS

Water-Slurry Process: Vinyl Compounds for Phonograph Records. A five-pound sample of a vinyl compound for phonograph record molding, prepared in laboratory facilities, was shipped for evaluation to Mr. Steve Krumm of the Bound Brook Laboratory. The procedure involved first a dispersion in water (~80°C.) of a preground slurry of carbon black and two powdered lead stabilizers in isopropanol followed by the addition of the mixture of the VYCR-10 and QYAC-10 resins. The dried compound contained an apparently uniform dispersion of the ingredients.

Preliminary findings of a study in progress suggests an isopropanol-water mixture can be used in place of isopropanol to prepare the initial carbon black-stabilizer dispersion. The study is intended to define the minimum amount of isopropanol required to yield a uniform dispersion.

J. W. Fields

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