

BUSINESS CONFIDENTIAL**MONTHLY REPORT**
(BUSINESS-SUPPORTED PROGRAMS)

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

FROM: J. J. Brezinski

DATE: August 18, 1967

347K10 VINYL RESINS GENERAL AND MISCELLANEOUS

Determination of Poly(Vinyl Chloride) in Vinyl Resins -

An improved method for the determination of percent poly(vinyl chloride) in vinyl resins has been developed. The method includes the use of the sodium peroxide Parr bomb combustion procedure, followed by an electrometric titration of the chloride ion. A direct titration is possible with silver nitrate solution using a special silver billet electrode No. 39261 developed by Beckman Instruments, Inc. The method yields results with a standard deviation of between ± 0.10 - 0.20 .

The procedure offers several significant advantages over the present test method WC-294-A, including a shorter analysis time. The method has been recommended for review by the Plant Laboratory groups at South Charleston and Texas City.

The procedure has been used to define the ethylene content of several vinyl chloride-ethylene copolymers. The results reveal that the "O" resins contain a higher ethylene content than that based on the present calibration curve used with the infrared technique; the new Paar bomb values will be used for recalibration of the infrared curve.

G. H. Potter, S. Engle,
J. W. Fields, J. E. Conley

Metal Analysis of Vinyl Resins - Emmission spectroscopic

analysis by the South Charleston Plant Laboratory reveals that both Lucovyl GB-1210 (made by the Pechiney-St. Gobain two-stage bulk process) and a sample of the Leavyn fibre, manufactured in Italy from (reportedly) syndiotactic poly(vinyl chloride), both contain relatively high concentrations of iron (~ 20 ppm) and substantial amounts of magnesium, aluminum, and silicon (estimated at ~ 100 ppm). The Leavyn fibre also contains 20 ppm of tin, which may be associated with a tin stabilizer.

The origin of the high magnesium, aluminum and silicon in the resins has not been established. Dr. F. E. Bailey suggests that perhaps the catalyst used in the Pechiney-St. Gobain process may be deposited on fine particle size Zeolite, which then serves as the site of controlled particle initiation in the first phase of the process.

No reason for the presence of these metals in the Lucovyl fibre is obvious at this time.

The Lucovyl GB-1210 showed unexpected poor electrical properties in an earlier evaluation on wire at Bound Brook.

J. W. Fields, J. W. Kearns, E. C. Morris

Correlation of Hard Resin Particles Content with Total Interior Pore Volume and Apparent Particle Density Distribution - A study of selected vinyl resins, several of which have been recommended for use in blown bottles and rigid sheet, reveals that a very good correlation exists between the hard resin particle content and the apparent particle density distribution. The hard resin particle content was rated in 10-mil pressed dyed films prepared from a test flexible compound hot-processed in the C. W. Brabender Plasticorder using very mild conditions; the hard particles were counted using maximum illumination in the viewing chamber (300-foot lumens). The apparent density distribution was patterned after a procedure used by Kureha Limited and involves the use of graduated density solutions prepared from zinc chloride and water.

Resins characterized by a low percentage of particles of apparent density >1.225 show low hard resin particle content. The two QXOL-7 resins (Blend 1 and Blend 2 - uncontaminated samples) show the lowest hard resin particle content and lowest percentage of particles of density <1.225 of the resins studied.

The limited correlation observed between interior pore volume, determined by mercury intrusion porosimetry, and hard resin particle content may be due to the pressure limitation (3000 psi) on the available instrument which limits the pore-size penetrated by mercury to 0.058 micron. The instrument is being modified to allow pressures up to 5000 psi (0.035 micron limited pore penetration). after which the correlation with hard resin particles will be rechecked.

The two QXOL-7 resins showed the highest interior pore volume of the series evaluated.

J. W. Fields, R. A. Frame, J. E. Conley

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