

Goodrich

INTER ORGANIZATION CORRELATION CONFERENCE

TO

J.A. Glass

FROM

T.A. Kenat

SUBJECT

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Jan. 8, 1980

VCM Quality Review, Calvert City, December 18, 1979

I attended this meeting as a representative of the Vinyl Chloride Monomer Group. Those in attendance were:

E.E. Atkins	G.E. Evans	R.S. Kinnaman	K.V. Rombelman
B.A. Barnes	P.D. Guene	M.H. Marty	G.D. Schaaf
G.R. Black	J.R. Harper	R.G. Molloy	D.B. Schrock
J.R. Byrum	A.L. Keller	P.E. Pearce	F.H. Sollman
B.E. Dunn	T.A. Kenat	W.A. Reed	J.M. Whitney

G.D. Schaaf introduced the meeting with a discussion of the problem of coarse charges. He reviewed the problem and the work done on coarse charges, making basically the same presentation as he had made at Avon Lake on December 7. He then discussed the uniformity of monomer quality, comparing BFG with our competitors. Our specifications are broader than those of our competitors but in general the actual levels are farther below the maximum specs so that the quality in general is about equivalent. However there has been a general increase in the amount of off spec monomer produced at Calvert City going from less than 1% in early 1978 to as high as 8-10% recently. It is important that the cause of this problem be remedied.

G.R. Black then reviewed the vinyl monomer manufacturing process. He first gave a general description of the process then detailed the history of construction of the various sections of the Calvert City plant. He then described in greater detail the EDC cracking process and discussed the butadiene problem with the steps that have been taken to remedy it.

E.E. Atkins reviewed Calvert City's quality control procedures. These are used to determine whether a lot of monomer is to be shipped or returned to off spec material for rework. The cost of reworking monomer amounts to approximately 4¢/lb. in out-of-pocket costs, not including the loss of capacity resulting from rework.

F.H. Sollman reviewed the tank car handling procedure. The oxygen in the vapor space of the tank car is measured for both safety and specification. If the level is below 5,000 ppm, the car is loaded from the top. If the oxygen level had been below 500 ppm, the car is sealed and shipped. If it had been between 500 and 5,000 it is retested. If it is then over 5,000 ppm it is vented until the oxygen level is below that. If the oxygen in the car had been over 5,000 ppm before loading, the car is loaded from the bottom. It is then vented and weathered until the oxygen is below 500 ppm.

A series of specific problems in vinyl monomer quality were then discussed. A major problem has been contamination with polymer, iron oxides and chlorides, and caustic. Regular tank car cleaning has been suspended since 1975 as a result of OSHA regulations. This has resulted in more contamination problems.

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In order to watch for this some plants have installed bullseyes in the sphere charging lines to observe monomer being loaded from tank cars into spheres and watch for indications of contamination. Pedricktown has a continuous monomer filtration system where monomer from the bottom of a sphere is withdrawn, filtered and returned to the sphere. This results in continuous turnover of the sphere and removal of solid contaminants.

Oxygen contamination is another serious problem as it may lead to formation of peroxide and thus polymer. One major possible cause is incomplete closing of the valves of a car that has just been emptied so that air may enter the car on its return trip to Calvert City. To solve this problem all polymer plants must be sure that valves are tightly closed before cars are returned to Calvert. Calvert can also possibly reduce oxygen by loading all cars from the bottom so that there is less agitation and less opportunity for the oxygen to dissolve in the monomer.

Contamination with caustic, which leads to a high pH in the polymerization reactor, could be eliminated by eliminating the caustic scrubber and allowing a higher amount of HCl in the product monomer. Recently contamination with monovinylacetylene has been observed. This is a result of lower reflux ratios in the vinyl columns since we have been chlorinating out butadiene. It may be necessary to increase these reflux ratios to solve this problem. Another contaminant which sometimes occurs is acetylene. This is probably a result of caustic dehydrochlorination of the vinyl chloride in the caustic scrubbers. This is another reason for elimination of the caustic scrubbers.

After this discussion a number of possible actions were listed as follows:

1. Closing tank car valves tightly at plants to keep out oxygen.
2. Bottom loading of tank cars to keep oxygen levels lower.
3. Use of filtration to remove solid contaminants.
4. Installation of bullseyes in all transfer lines from tank cars to storage spheres.
5. Analysis of contaminants found in monomer.
6. Use of a turbidity analyzer and correlation of turbidity with polymer in the monomer.
7. Sampling of cars with high oxygen levels for polymer.
8. Comparing our car loading procedures with those of Dow Canada, who supplies Niagara Falls.
9. Correlating high levels of monovinylacetylene with polymer quality.

G.R. Black and G.B. Schauf are to issue a detailed joint report on this meeting.


T.A. Kame

TAK/lk

cc: VCH Group
G.R. Black
F.J. Donat
G.B. Schauf

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