

MONSANTO CHEMICAL COMPANY

Texas City, Texas

cc: J. V. Waggoner
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To: W. F. Zimmerman

July 3, 1958

At: Texas City, Texas

Subject: Uninhibited VCM Stability

Reference: DM Brown to WF Zimmerman
6-27-58

This is in reply to Question 1. in the reference memo: Will we have a stability problem in shipping uninhibited vinyl chloride monomer?

Stability and storage tests conducted by Monsanto have been summarized in the following reports and memos:

Hunter to Eckert 11-8-56
Yates to Vinyl PRES Board 1-6-58
Plastics Div. Research Dept. (Spfld.) No. 567
Texas Div. Research Dept. No. 116

This work indicated that polymerization does not occur under the conditions described when VCM is stored in steel.

Recently we have made some further calculations on the conditions necessary to get a runaway polymerization. These calculations were based on kinetic data obtained in the following:

Plastics Div. Res. Dept. (T.C.) No. 176
Plastics Div. Res. Dept. (Spfld.) N . 804
Bengough and Norrish, Proc. Royal Soc. 200, 301 (1950)

Assumptions were:

1. That mixing of a tank car will keep the temperature uniform on the inside.
2. That the heat transfer coefficient through the tank car to the air is about 10 BTU/ft²/hr/°F.
3. That the monomer in the car is as pure as that carefully purified in the laboratory.
4. That the polymerization rate in the tank car is the same as in glass.

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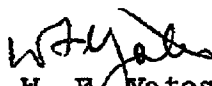
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The results showed that if the temperature in the car rises to 104°F, the outside temperature must be 94°F or lower to safely remove heat of polymerization. At a temperature of 122°F in the car the outside temperature must still be 94°F or lower. At 140°F in the car the outside temperature must be 66°F to remove the heat of polymerization.

Since it is doubtful that such ideal conditions would occur and allow a runaway polymerization we feel that the stability uninhibited VCM would not be a problem in shipping.

One other point--our VCM normally contains 20-40 ppm of chloroprene--which is as effective an inhibitor as phenol. As far as ICC is concerned we are still shipping inhibited VCM.


W. F. Yates

WFY:jad

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