JJH: JCL: TGG: RF
XF: Tom

TO: Distribution

FROM: T. G. Grumbles
DATE: September 11, 1984

nteroffice
:ommunication

SUBJ: VISTA COMMENTS TO THE FDA: GRAS REVOCATION OF BYPRODUCT MURIATIC ACID

VISTA

Enclosed is a draft of the comments we will send to FDA regarding the agency's proposal to revoke the GRAS status of all byproduct muriatic acid. Please review and return any comments or changes to me or Betsy Myer by September 19. We need to have the final comments in the mail by September 21.

Thomas G. Grumbles

ajo

Enclosure

cc Tom Huffman, Bob Klein, Mike Fortier, R. D. Gamblin

Distribution: Jim Gibson, Kyle Resh, Carl Kerfoot, Betsy Myer
Wayne Hilger, Nelson Borys, Bill McClain

VEV-143855

A

September 11, 1984 D R A F T

Dockets Management Branch (HFA-305)
Food and Drug Administration
Room 4-62
5600 Fishers Lane
Rockville, MD 20857

Dear Sirs:

Vista Chemical Company (formerly Conoco Chemicals Company) is a major producer of byproduct ~~muriatic~~ hydrochloric acid ~~in~~ from the NALKYLENE Detergent Alkylate process at its plant in Baltimore, Maryland. Vista appreciates the opportunity to comment on the FDA proposal to revoke the GRAS status of byproduct hydrochloric acid, which appeared in the Thursday, April 26, 1984 Federal Register.

The FDA stated that the reason for this action is the concern for undesirable contaminants in byproduct acid. The potential for specific organic contaminants to be contained in byproduct acid is highly variable, dependent on the process involved and the post treatment of the acid after production. To categorically revoke GRAS status for all byproduct hydrochloric acid regardless of general or specific contaminants levels in the final product, is ~~not an appropriate manner to~~ an arbitrary and unreasonable approach to address the ~~contaminant~~ of acid contamination concern. ★ It would seem more appropriate and less arbitrary to develop performance standards based on process design or specific contaminant levels in finished product.

The Agency stated that to evaluate a specific type of byproduct hydrochloric acid [redacted] information was needed regarding the manufacturing

VEV-143856

★ The contaminant levels in VISTA Chemical's acid, in particular, do not support the need for a categorical ban of by-product acid.

process and contaminant levels. The following is offered in order to supply that information on Vista Chemical's process.

VISTA PROCESS DESCRIPTION

Vista's NALKYLENE alkylate process is a propritary process which reacts normal paraffins with chlorine to produce chloroparaffin and then alkylates the chloroparaffin ~~with benzene~~ benzene with in a Friedel-Crafts reaction catalyzed with aluminum chloride. Both the chlorination and alkylation reaction liberate HCl gas which is absorbed in water to produce muriatic acid. The ~~muriatic~~ hydrochloric acid is then subjected to multiple purification steps before being sold. A more complete description of the ~~HCl/muriatic~~ hydrochloric acid production and purification process at the Vista plant is as follows:

Chlorination Step

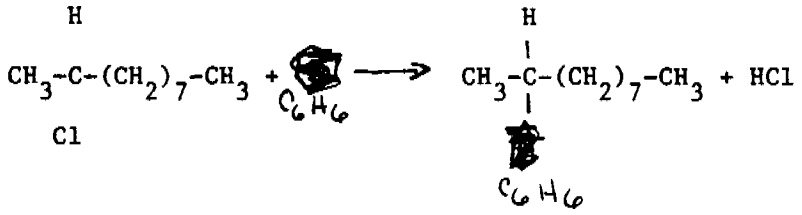
The major feedstocks to the chlorination section of the Vista NALKYLENE process are normal paraffins in the decane to dodecane range and chlorine. Chlorine is fed into a chlorination reactor where it reacts with liquid paraffin to form chloroparaffin. The chlorination step liberates gaseous HCl by the following reaction:

$$CH_3(CH_2)_8CH_3 + Cl_2 \quad \longrightarrow \quad CH_3\text{-}\underset{\displaystyle Cl}{\overset{\displaystyle H}{\underset{|}{\overset{|}{C}}}}\text{-}(CH_2)_7\text{-}CH_3 + HCl$$

Off gas from the chlorination reactor is sent through a chlorine absorber where normal paraffin is used to react with any chlorine residual in the off gas. Chlorine free HCl off gas flows from the chlorine absorber to the HCl purification/absorption section of the process.

Alkylation Step

The chloroparaffin from the chlorination section of the Vista NALKYLENE alkylate process flows to the alkylation section and is reacted with benzene and follows the typical ~~by means of a~~ Friedel-Crafts reaction ~~using~~ where anhydrous aluminum chloride acts as the catalyst. The alkylation section also liberated HCl gas by the following reaction:



The HCl gas from the alkylation reaction is separated from the crude alkylation reaction liquid under a slight vacuum in order to remove as much HCl as possible. The HCl off-gas is compressed and fed to the HCl purification/absorption section of the Vista process.

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HCl Purification/Absorption

Since the alkylation reaction is carried out in the presence of excess benzene the off-gas from the alkylation section contains benzene as well as HCl. There is also a limited quantity of benzene in the chlorination section off-gas. ~~In~~ During the initial step ~~in~~ of the HCl purification/absorption process the benzene concentration in the HCl off-gas streams is greatly reduced by contacting the combined chlorination/alkylation off-gas streams with chloroparaffin in an absorption tower. The chloroparaffin ~~absorbs~~ reacts with benzene. The HCl gas is then sent to a second absorption process where fresh water is used to absorb the HCl gas to form ~~muriatic~~ hydrochloric acid. The chloroparaffin stream is sent to the alkylation reaction section.

Fresh water is used in a two stage falling film absorption process to convert the HCl gas into muriatic acid. Final scrubbers remove any residual HCl from the inert gases which were present in the off-gas HCl prior to their venting to the atmosphere. The crude muriatic acid product is sent to the acid purification section.

~~Muriatic~~ Hydrochloric Acid Purification

The crude ~~muriatic~~ hydrochloric acid from the acid absorption process contains about 1000 ppm of organic contaminants. ~~—primarily benzene.~~

Therefore, additional purification is required to produce a final ~~muriatic~~ hydrochloric acid product. Purification is accomplished in two steps by first contacting the ~~muriatic~~ hydrochloric acid with pure paraffin feedstock in a two stage contact/separation step and then final filtration with activated carbon.

A pure paraffin stream is contacted with the ~~muriatic~~ hydrochloric acid and then separated from the acid in a coalescing filter/separation vessel. Two vessels are used in series to get the optimum contact and separation. The pure paraffin stream absorbs benzene and other organic contaminants from the ~~muriatic~~ hydrochloric acid. It is however, almost completely insoluble in acid itself. Therefore, the total organic content of the ~~muriatic~~ hydrochloric acid is reduced to about 10 ppm after this step. The final carbon filtration step reduces the total organic concentration to less than 0.1 ppm (by hexane extraction analysis) and the benzene concentration to less than 50 ppb (by photo ionization detector chromatograph).

To summarize the byproduct acid produced by the process described above will contain less than 0.1 ppm of total extractable organics and less than 0.05 ppm benzene.

The agency also requested data on the food catagories to which the acid is added and organic contaminants remaining in the food. Much of this information is not available to Vista as a producer. This data would best be obtained from the users of ~~muriatic~~ hydrochloric acid.

In addition to the above key items, we believe you should also be aware of the following potential financial impacts. A ban of by-product muriatic acid from food-grade non food-grade acid among the by-product producers. This will likely cause a decrease in the non food-grade acid price and will result in the destruction (neutralization) of much of the excess acid. Muriatic acid neutralization is costly and poses the potential environmental problem of HCl vapor release. Further more, there will quite likely be regional supply shortages of on-purpose muriatic acid resulting in increased transportation costs to the food-grade consumers.

We realize that on paper there will be no more acid being produced and things may appear to balance out. However, in reality muriatic acid inventory capabilities are small and timing is critical. We believe a disruption of this size to the market would take years to stabilize and would result in a price difference between by-product and on-purpose muriatic acid significantly larger than FDA has estimated.

See attachment

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Overall impression - Excellent

Some suggestions enclosed regarding wording of chemical processes.

VEV-143865

A

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Food and Drug Administration
Room 4-62
5600 Fishers Lane
Rockville, MD 20857

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The FDA stated that the reason for this action is the concern for undesirable contaminants in byproduct acid. The potential for specific organic contaminants in byproduct acid is highly variable, dependent on the process involved and the post treatment after production. To categorically revoke GRAS status for all byproduct acid regardless of general or specific contaminants levels in the final product, is not an appropriate manner to address the contaminant concern. It would seem more appropriate to develop performance standards based on process design or specific contaminant levels in finished product.

The Agency stated that to evaluate a specific type of byproduct hydrochloric information was needed regarding the manufacturing

VEV-143866

process and contaminant levels. The following is offered in order to supply that information on Vista Chemical's process.

VISTA PROCESS DESCRIPTION

Vista's NALKYLENE process is a propritary process which reacts normal paraffins with chlorine to produce chloroparaffin and then alkylates the chloroparaffin with benzene in a Friedel-Crafts reaction catalyzed with aluminum chloride. Both the chlorination and alkylation reaction liberate HCl gas which is absorbed in water to produce muriatic acid. The muriatic acid is then subjected to multiple purification steps before being sold. A more complete description of the HCl/muriatic acid production and purification process at the Vista plant is as follows:

Chlorination Step

The major feedstocks to the chlorination section of the Vista NALKYLENE process are normal paraffins in the Decane to Dodecane range and chlorine. Chlorine is fed into a chlorination reactor where it reacts with liquid paraffin to form chloroparaffin. The chlorination step liberates gaseous HCl by the following reaction:

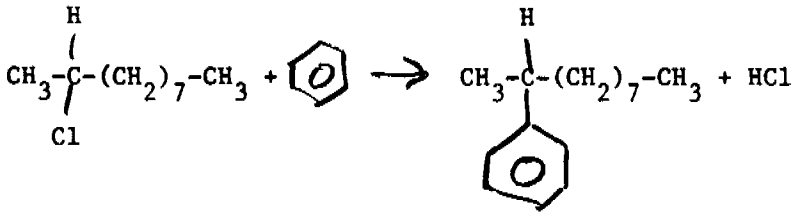
$$CH_3(CH_2)_8CH_3 + Cl_2 \qquad CH_3-\underset{\displaystyle Cl}{\overset{\displaystyle H}{\overset{|}{\underset{|}{C}}}}-(CH_2)_7-CH_3 + HCl$$

* One alkylates benzene with chloroparaffin you don't alkylate chloroparaffin with benzene

Off gas from the chlorination reactor is sent through a chlorine absorber where normal paraffin is used to react with any chlorine residual in the off gas. Chlorine free HCl off gas flows from the chlorine absorber to the HCl purification/absorption section of the process.

Alkylation Step.

The chloroparaffin from the chlorination section of the Vista NALKYLENE process flows to the alkylation section and is reacted with benzene ~~by means of~~ and follows the typical Friedel-Crafts reaction ~~using~~ where anhydrous aluminum chloride catalyst, acts as the. The alkylation section also liberated HCl gas by the following reaction:



The HCl gas from the alkylation reaction is separated from the crude alkylation reaction liquid under a slight vacuum in order to remove as much HCl as possible. The HCl off-gas is compressed and fed to the HCl purification/absorption section of the Vista process.

I thought our process had very little C_{10} (18-21%) maybe better to use C_{11} as the example?

HCl Purification/Absorption

physical vs chemical process.

Since the alkylation reaction is carried out in the presence of excess benzene the off-gas from the alkylation section contains benzene as well as HCl. There is also a limited quantity of benzene in the chlorination section off-gas. ~~In~~ During the initial step of the HCl purification/absorption process the benzene concentration in the HCl off-gas streams is reduced by contacting the combined chlorination/alkylation off-gas streams with chloroparaffin in an absorption tower. The chloroparaffin ~~absorbs~~ reacts with benzene. The HCl gas is then sent to a second absorption process where fresh water is used to absorb the HCl gas to form muriatic acid. The chloroparaffin stream is sent to the alkylation reaction section.

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Muriatic Acid Purification

This is the most important aspect of our Muriatic Acid production scheme.

The crude muriatic acid from the acid absorption process contains about 1000 ppm of organic contaminants - primarily benzene.

Therefore, additional purification is required to produce a final muriatic acid product. Purification is accomplished in two steps by first contacting the muriatic acid with pure paraffin feedstock in a two stage contact/separation step and then final filtration with activated carbon.

A pure paraffin stream is contacted with the muriatic acid and then separated from the acid in a coalescing filter/separation vessel. Two vessels are used in series to get the optimum contact and separation. The pure paraffin stream absorbs benzene and other organic? contaminants from the muriatic acid. It is however, almost completely insoluble in acid itself. Therefore, the total organic content of the muriatic acid is reduced to about 10 ppm after this step. The final carbon filtration step reduces the total organic concentration to less than 0.1 ppm (by hexane extraction analysis) and the benzene concentration to less than 50 ppb (by photo ionization detector chromatograph).

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read sentence

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Can we say how much?

Could mention that Muriatic Acid Market is already over capacity with respect to by product grade and would become worse with the ban.