Vista Chemical Company

900 Threadneedle
Houston, Texas 77079-2990
(713) 588-3000

P.O. Box 19029
Houston, Texas 77224-9029
Fax (713) 588-3236

October 2, 1990

TGG: JCL: ERT: MJH: AJC: RF

VISTA

XF: _____

National Sanitation Foundation
3475 Plymouth Road
P. O. Box 1468
Ann Arbor, Michigan 48106

Attention: Kathy Feist

Dear Kathy:

Attached is a Section B review form for Vista Hydrochloric Acid. This is being submitted in support of an application by Crompton & Knowles Corporation, Dyes & Chemical Division.

Sincerely,

Thomas G. Grumbles, C.I.H.
Manager Environmental Affairs

dlj

cc: R. R. Cooley

Initial if NSF
Std. 60/61-Listed

NSF USE ONLY [ ]
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Company No. _____
Accepted By _____

TOXICOLOGY DATA REVIEW SUBMISSION - SECTION B

NATIONAL SANITATION FOUNDATION
STANDARD 60 DRINKING WATER ADDITIVES
(CONFIDENTIAL INFORMATION)

SECTION B. TO BE COMPLETED BY SUPPLIER, unless the ingredient is NSF Standard 60- or 61-Listed. (See instructions before completing).

Supplier name Vista Chemical Company

Address 900 Threadneedle
Houston, Texas 77079

Name/Telephone number of Supplier contact Tom Grumbles
713-588-3445

Plant location/address 3441 Fairfield Road
Baltimore, MD 21226

Name/Telephone number of plant contact Joe Gregg 301-354-5964

1. Name of chemical (use nomenclature adopted by Chemical Abstracts)
hydrochloric acid

2. Chemical Abstracts Services (CAS) number (if applicable) 7647-01-0

3. Trade name Muriatic Acid

4. Structural formula (if applicable)
Not applicable - water solution of HCL

5. Molecular weight (average molecular weight distribution, if polymer)
36.5

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6. Describe the method of manufacture of the ingredient listed above. Specify chemicals used in the manufacturing process. If the ingredient is synthesized, give reactants, catalysts, process aids, etc. If the ingredient is mined, give chemicals used in the processing and purification, etc. (Use additional pages as necessary). See Attachment I

7. Composition of formulation and related information: List suppliers and chemical names of materials, ingredients, reactants. Place an M,I,R,P in the column marked ( ) to indicate if the chemicals shown below are Materials, Ingredients, Reactants, or Processing aids. Include manufacturing tolerances for parts by weight (percent composition).

( )	Trade Name	Chemical Description	CAS No.	Parts by Weight (%, ppm)	Supplier
I	Hydrogen chloride	HCl		32%	
M	Prouss	Water - H_2O		68%	
R	Chlorine	Cl_2		<1 ppm	PPG, Olin, Occidental
P	Activated Carbon	Carbon		<1 ppm	Envirotrol
R	Benzene	C_6H_6		<50ppb	Texaco, Sun
R	Paraffin			< 1 ppm	Vista Lake Charles
M	Aluminum chloride	$AlCl_3$		< 1 ppm	Vanchlor, Witco, Welland

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ATTACH KNOWN METHOD(S) OF ANALYSIS FOR FORMULATION OR INGREDIENTS, IF AVAILABLE.

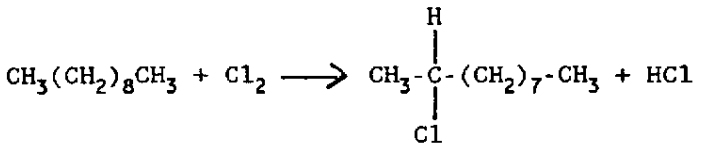
ATTACHMENT 1

VISTA PROCESS DESCRIPTION - HYDROCHLORIC ACID PRODUCTION

Vista's NALKYLENE® alkylate process is a proprietary process which reacts normal paraffins with chlorine to produce chloroparaffin and then alkylates benzene with the chloroparaffin 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 hydrochloric acid. The hydrochloric acid is then subjected to multiple purification steps before being sold. A more complete description of the hydrochloric acid production and purification production and purification process at the Vista plant is as follows:

CHLORINATION STEP

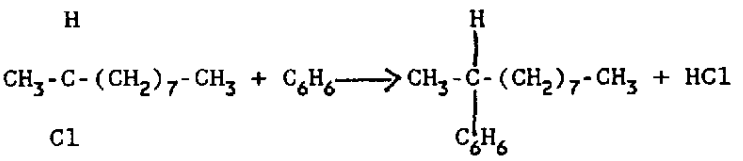
The major feedstocks to the chlorination section of the Vista NALKYLENE® process are normal paraffins in the decane to dodecane range and chlorine. Chlorine is fed into a chlorination reactor where it reacts with liquid paraffin to form chloroparaffin. The chlorination step liberates gaseous HCl by the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



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 Friedel-Crafts reaction where anhydrous aluminum chloride acts as the catalyst. The alkylation section also liberates 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 process.

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. During the initial step 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 benzene. The HCl gas is then sent to a second absorption process where fresh water is used to absorb the HCl gas to form 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 hydrochloric 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 hydrochloric acid product is sent to the acid purification section.

HYDROCHLORIC ACID PURIFICATION

The crude hydrochloric acid from the acid absorption process contains about 1000 ppm of organic contaminants, therefore, additional purification is required to produce a final hydro-chloric acid product. Purification is accomplished in two steps by first contacting the 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 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 hydrochloric acid. It is however, almost completely insoluble in acid itself. Therefore, the total organic content of the 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 0.05 ppm (by photo ionization detector chromatograph).

To summarize the byproduct hydrochloric 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.

8. Has the purity or expected purity range of the ingredient been determined?

X yes ____ no ____ unknown to this Company

If yes, specify the purity or expected purity range 31.45 to 32.75% HCL

9. Specify known or suspected impurities in the ingredient including, but not limited to: unreacted starting materials, impurities in the starting materials, products of side reactions, and low molecular weight polymer fractions. See Attachment II

10. If the ingredient is not intended to be dissolved in drinking water, has the water solubility been determined?

____ yes ____ no X unknown to this Company ____ not applicable

If yes, specify the water solubility. Include the temperature and pH conditions under which the solubility was determined.

11. If the PRODUCT is not intended to be dissolved in drinking water, has migration/extraction of any INGREDIENT from the product to water (or other solvent) been determined?

____ yes ____ no X Unknown to this Company ____ not applicable

If yes, attach report or complete the following information. If information is available for more than one ingredient, attach the relevant report or copy this page for each ingredient.

Ingredient ____
Product or form in which the ingredient was tested ____
Amount tested ____ Concentration of ingredient ____
Solvent ____ Amount of solvent ____
Temperature of test ____ pH of test ____
Duration of test ____
Method of ingredient analysis ____
Detection limit of method ____
Sensitivity of method ____
Level of ingredient migrating/extracting ____

12. If the PRODUCT is not intended to be dissolved in drinking water, has migration/extraction of an IMPURITY in any ingredient from the product to water (or other solvent) been determined?

____ yes ____ no X Unknown to this Company ____ not applicable

If yes, attach report or complete the following information. If information is available for more than one impurity, attach the relevant report or copy this page for each impurity.

Impurity ____
Product or form in which the ingredient was tested ____
Amount tested ____ Concentration of ingredient ____

(Continued next page)

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ATTACHMENT II
QUESTION 9 RESPONSE

Unreacted Starting Materials	Impurities In Starting Materials	Other Contaminants
Chlorine (<1 ppm)*	Aluminum (<1 ppm)	Benzene (<10 ppb)
	Calcium (16 ppm)	Toluene (<25 ppb)
	Iron (<1 ppm)	
	Magnesium (5 ppm)	
	Sodium (6 ppm)	
	Chloroform (<20 ppb)	
	1-2 Dichloroethane (<100 ppb)	
	Methy Chloride (0.6 ppm)	
	Methylene Chloride (40 ppb)	
	Chloroethane (25 ppb)	

* Typical concentration in Hydrochloric Acid Product

ppm = parts per million
ppb = parts per billion

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Solvent_____ Amount of solvent_____
Temperature of test_____ pH of test_____
Duration of test_____
Method of impurity analysis_____
Detection limit of method_____
Sensitivity of method_____
Level of impurity migrating/extracting_____

13. If a contaminant (product, material, ingredient, reactant, or impurity) has received prior acceptance or clearance, please list contaminant(s) and cite specific acceptance reference (e.g. Title 21 Code of Federal Regulations, with appropriate section and paragraph number, Food Chemicals Codex, US Environmental Protection Agency National Primary Drinking Water Regulations). If a Maximum Contaminant Level (MCL) has been determined under the USEPA National Primary Drinking Water Regulations, please list the MCL.

Contaminant (Prod., material, ingred., impurity)	Acceptance Reference	Use Restrictions	Level in Drinking Water[1]
1			
2			
3			
4 See Attachment III			
5			
6			
7			
8			
9			
10			

14. If any material, ingredient, or other chemical introduced into drinking water as a result of product use should be exempt from toxicology evaluation, please specify and PROVIDE JUSTIFICATION (e.g. non-migratory, no residual, MCL available)._____

NOTE: IF ITEMS 13 AND/OR 14 ADDRESS ALL MATERIALS, INGREDIENTS, REACTANTS, AND IMPURITIES IN THE PRODUCT, THEN SKIP ITEMS 15, 16, 17, AND GO TO ITEM 18.

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[1]Anticipated level in drinking water based on the Evaluation Dose as described in Standard 60, and using accepted methods as described in Standard 60, Appendix B.

ATTACHMENT III
QUESTION 13 RESPONSE

ACCEPTANCE REFERENCES FOR PRODUCT AND CONTAMINANTS

PRODUCT

1. FCC Hydrochloric Acid Monograph - 3rd Edition
   Specific limits: Benzene <0.05 mg/kg
   Extractable Organic Compounds <5mg/kg
   (non-fluorine containing)

2. FDA 21 CFR 182.1057
   Hydrochloric Acid is multiple Purpose GRAS Food Substance when used as butter and neutralizing agent.

CONTAMINANTS

1.	Benzene	U.S. EPA Primary Drinking Water Standard (MCL)	5 µg/l
2.	1-2 Dichloroethane	U.S. EPA Primary Drinking Water Standard (MCL)	5 µg/l
3.	Methylene Chloride	U.S. EPA Primary Drinking Water Standard (MCL)	5 µg/l (proposed 1990)
4.	Chloroform	U.S. EPA Primary Drinking Water Standard (MCL)	(Included in total Trihalomethane limits of 0.1 µg/l)

Document control code (NSF use)_____

15. The anticipated exposure level will dictate toxicology testing requirements. NSF may require complete copies of all toxicity reports. Please list the specific toxicology studies and dates conducted, the results of which are to be used in support of the product application. Toxicology studies may describe the potential toxicity of the product, or of a particular material, ingredient, or extraction mixture appropriate to the application. (Use additional pages, if necessary.)

Mutagenicity (Specify Ames, chromosomal aberration, etc.)

Type of study_____

Report title_____

Report date/Journal reference_____
Author or conducting laboratory_____

Type of study_____

Report title_____

Report date/Journal reference_____
Author or conducting laboratory_____

Acute toxicity

Type of study_____

Report title_____

Report date/Journal reference_____
Author or conducting laboratory_____

Type of study_____

Report title_____

Report date/Journal reference_____
Author or conducting laboratory_____

Subchronic toxicity

Type of study_____

Report title_____

Report date/Journal reference_____
Author or conducting laboratory_____

Type of study_____

Report title_____

Report date/Journal reference_____
Author or conducting laboratory_____

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Reproductive/developmental toxicity

Type of study_____

Report title_____

Report date/Journal reference_____
Author or conducting laboratory_____

Type of study_____

Report title_____

Report date/Journal reference_____
Author or conducting laboratory_____

Teratology

Type of study_____

Report title_____

Report date/Journal reference_____
Author or conducting laboratory_____

Type of study_____

Report title_____

Report date/Journal reference_____
Author or conducting laboratory_____

Chronic toxicity/carcinogenicity

Type of study_____

Report title_____

Report date/Journal reference_____
Author or conducting laboratory_____

Type of study_____

Report title_____

Report date/Journal reference_____
Author or conducting laboratory_____

Supplemental studies (specify metabolism, neurotoxicity, etc.)

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Type of study_____

Report title_____

Report date/Journal reference_____
Author or conducting laboratory_____

Document control code (NSF use) _____

Type of study _____

Report title _____

Report date/Journal reference _____
Author or conducting laboratory _____

Type of study _____

Report title _____

Report date/Journal reference _____
Author or conducting laboratory _____

16. If a toxicology literature search has been conducted, please list the databases, database files, and the key words searched. Attach a copy of the search results.

DATABASE	FILE	KEY WORD STRINGS

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17. Additional information sources _____

18. Please describe or attach any additional pertinent information, positive or negative, that you believe would contribute to a complete toxicologic evaluation of the product or ingredient.

19. Additional attachments? ___no X yes Number of attachments 3

List attachments	No. of pages
1	(2)
2	1
3	1

20. Supplier certification:

I hereby certify that the information provided is accurate and complete, and that I, and the Company I represent, know of no reason the product described herein should not be used in contact with drinking water.

Signature T. G. Grumbles Date 10/2/90

Typed or printed name Thomas G. Grumbles

Position or title Manager Environmental Activities

Company name Vista Chemical Company

Phone 713-588-3445 Telex _____ FAX 713-588-3456

(The following authorization is OPTIONAL. It in no way authorizes NSF to share the information with other Suppliers or Applicants. Authorized NSF staff ONLY will be allowed access to this information.)

I give the National Sanitation Foundation permission to use the information contained in this TDRS Part B application as a basis for reviewing/accepting other products which use the ingredient/material/ product covered by this application.

Signature/Title _____

Insert completed form in the Confidential Business Information envelope provided, seal the confidential envelope in an outer envelope, and return to:

Additives Toxicology Group
NATIONAL SANITATION FOUNDATION
P.O. Box 1468
Ann Arbor, MI 48106

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