



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

JAN 13 1994

OFFICE OF  
PREVENTION, PESTICIDES AND  
TOXIC SUBSTANCES

**MEMORANDUM**

**SUBJECT: Chlorine Product and Residue Chemistry Chapters for the Reregistration Eligibility Document (RED).**

CBRS No.: 13057.  
DP Barcode No.: D198289.  
Chemical No.:020501.  
Reregistration Case No.:4022.

**FROM: Bonnie Cropp-Kohlligian, Environmental Scientist**  
Reregistration Section I  
Chemistry Branch II: Reregistration Support  
Health Effects Division [7509C]

*Bonnie Cropp-Kohlligian*

**THRU: Paula A. Deschamp, Section Head**  
Reregistration Section I  
Chemistry Branch II: Reregistration Support  
Health Effects Division [7509C]

*RB Paerfetta for*

**TO: Esther Saito, Ph.D.**  
Chemical Coordination Branch  
Health Effects Division [7509C]

Attached are the Chlorine Product and Residues Chemistry Chapters for the Chlorine RED completed by CBRS, HED.

If you need additional input please advise.

Attachment: Product Chemistry and Residue Chemistry Chapters.

cc: BLCKohlligian (CBRS), Tom Myers ARB/SRRD (7508W), Chlorine Phase 4 File, Chlorine SF, RF, Circulate.

RDI: PDeschamp:1/10/94 EZager:1/13/94  
7509C:CBRS:BLCKohlligian:CM#2:Rm 805B:703-305-7462:1/13/94.



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## CHLORINE

### REREGISTRATION ELIGIBILITY DOCUMENT:

#### PRODUCT CHEMISTRY CONSIDERATIONS

(Shaughnessy No. 020501; Case No. 4022)

#### TASK 2A

#### DESCRIPTION OF CHEMICAL

At normal pressures and temperatures, chlorine exists as a diatomic gas and is used in solution as a disinfectant, sanitizer, bacteriostat, microbicide/microbiostat, and algicide.

Molecular Formula:	Cl <sub>2</sub>
Molecular weight:	70.906
CAS Registry No.:	7782-50-5
Shaughnessy No.:	020501

#### IDENTIFICATION OF ACTIVE INGREDIENT

Elemental chlorine exists as a greenish-yellow gas under standard conditions (25°C and 1 atmosphere) or as a high-density amber liquid when compressed. The chlorine TGAI is packaged as a liquified gas in pressurized containers. Chlorine gas is stable under pressure, and has a characteristic pungent bleach odor. Chlorine is slightly soluble in water, 8.3 kg/m<sup>3</sup> at 15.6°C and 1 atmosphere; however, in pure water, chlorine forms a weak mixture of hydrochloric and hydrochlorous acids. Chlorine is very reactive, acts as an oxidant, and hydrolyzes quickly in water.

#### MANUFACTURING-USE PRODUCTS

A search of the Reference Files System (REFS) conducted 1/13/94 identified nine registered chlorine manufacturing-use products (MPs) listed under Shaughnessy No. 020501. A list of the MPs subject to a reregistration eligibility decision is presented below. Members of the Chlorine Reregistration Task Group (CRTG) are bolded.

Formulation	EPA Reg. No.	Registrant	Date Registered
100% T	748-31	PPG Industries, Inc.	8/48
100% T	1258-779	Olin Corporation	1/67
100% T	7151-4	Alexander Chemical Corp.	5/72
100% T	8176-9	HVC	8/72
99.5% T	464-99	Dow Chemical Company	9/48
99.5% T	33458-1	Allied Universal Corp.	10/75
99.5% FI	335-178	Elf Atochem	4/64
99.5% FI	935-8	Occidental Chemical Corp.	7/48
99.5% FI	21139-5	LCP Chemicals	2/90

### REGULATORY BACKGROUND

The Chlorine Reregistration Phase IV Review, dated 12/2/92, by B. Cropp-Kohlligian, evaluated product chemistry data submitted by the CRTG. Data submissions for GLNs 61-2, 62-3, 63-2 through 63-4, and 63-7 through 63-9 were determined to be candidates for Phase V review. In addition, Registration Division (RD) completed a Chlorine Product Chemistry Phase V Review (D165649 and D166044, dated 4/7/92, by S. Malak) of the same database. CBRS has conferred with SRRD and agrees with the RD assessment of the data except for GLN 62-1. Preliminary analysis of five samples of the chlorine TGAI produced by each manufacturing process is required. We note that any subsequent food-use data submissions will be reviewed by CBRS/HED.

No data have been submitted for Agency review for the chlorine TGAI of products registered to non-CRTG members (Alexander Chemical Corporation, HVC, and Allied Universal Corporation); all product chemistry data requirements are outstanding for these products.

The current status of the product chemistry data requirements for the chlorine TGAI to support CRTG MPs and MPs produced by non-CRTG members is presented in the attached data summary tables. Refer to these tables for a listing of the outstanding product chemistry data requirements.

CONCLUSIONS

All pertinent data requirements, except for preliminary analysis (GLN 62-1) are satisfied for the chlorine TGAI of CRTG products. All TGAI data are outstanding for MPs of the non-CRTG members (Alexander Chemical Corporation, HVC, and Allied Universal Corporation). Provided that the registrants submit the outstanding data required in the attached data summary tables for the chlorine TGAI and either certify that the suppliers of the starting materials and the manufacturing processes for chlorine have not changed since the last comprehensive product chemistry review or submit complete updated product chemistry data packages, CBRS has no objections to the reregistration of chlorine with respect to product chemistry data requirements.

AGENCY MEMORANDA CITED IN THIS DOCUMENT

DP Barcode: D165649 and D166044  
Subject: RD Review of Product Chemistry data for Reregistration Phase V  
Review of a TGAI.  
Reviewer: S. Malak  
PM: B. Briscoe  
CRM: B. Crompton  
Dated: 4/7/92  
MRID(s): 41767301 through 41767303

PRODUCT CHEMISTRY CITATIONS

Bibliographic citations include only MRIDs containing data which fulfill data requirements.

References (cited):

41767301 Damico, J.; Doyle, J. (1991) Chlorine: Product Identity and Composition. Unpublished study prepared by SRA International, Inc. 3 p.

41767302 Damico, J. (1991) Chlorine: Analysis and Certification of Product Ingredients. Unpublished study prepared by SRA International, Inc. 11 p.

41767303 Damico, J. (1991) Chlorine: Physical and Chemical Characteristics. Unpublished study prepared by SRA International, Inc. 8 p.

Case No. 4022  
Chemical No. 020501

Case Name: Chlorine  
Registrant: Chlorine Reregistration Task Group (CRTG)  
Product(s): Chlorine TGAI

### PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements	
		Fulfilled? <sup>a</sup>	MRID Number <sup>b</sup>
61-1	Product Identity and Disclosure of Ingredients	N/A <sup>c</sup>	
61-2	Starting Materials and Manufacturing Process	Y	41767301
61-3	Discussion of Formation of Impurities	Y	41767301
62-1	Preliminary Analysis	N <sup>d</sup>	41767302
62-2	Certification of Ingredient Limits	N/A <sup>c</sup>	
62-3	Analytical Methods to Verify the Certified Limits	N/A <sup>c</sup>	
63-2	Color	Y	41767303
63-3	Physical State	Y	41767303
63-4	Odor	Y	41767303
63-5	Melting Point	N/A	
63-6	Boiling Point	N/A	
63-7	Density, Bulk Density or Specific Gravity	Y	41767303
63-8	Solubility	Y	41767303
63-9	Vapor Pressure	Y	41767303
63-10	Dissociation Constant	N/A	
63-11	Octanol/Water Partition Coefficient	N/A	
63-12	pH	Y	41767303
63-13	Stability	Y	41767303

<sup>a</sup> Y = Yes; N = No; N/A = Not Applicable. The CRTG members with registered MPs include PPG Industries, Inc., Olin Corporation, Dow Chemical Company, Elf Atochem, Occidental Chemical Corp., and LCP Chemicals.

<sup>b</sup> All data submissions were reviewed by the Registration Division (RD; D165649 and D166044, dated 4/7/92, by S. Malak) and CBRS (Chlorine Phase IV Review, dated 12/2/92, by B. Cropp-Kohlligian). CBRS has conferred with SRRD and agrees with the RD assessment of the data except for GLN 62-1.

<sup>c</sup> These data are not required for the TGAI, but will be required for individual products after issuance of the RED.

<sup>d</sup> These data do not satisfy the requirements of 40 CFR §158.170 (Guideline Reference No. 62-1) concerning preliminary analysis because the analysis of five samples of the chlorine TGAI produced by each manufacturing process is required.

Case No. 4022  
 Chemical No. 020501

Case Name: Chlorine  
 Registrant(s): Alexander Chemical Corporation, HVC, and  
 Allied Universal Corporation.  
 Product(s): Chlorine TGAI

**PRODUCT CHEMISTRY DATA SUMMARY**

Guideline Number	Requirement	Are Data Requirements Fulfilled? <sup>a</sup>	MRID Number
61-1	Product Identity and Disclosure of Ingredients	N/A <sup>b</sup>	
61-2	Starting Materials and Manufacturing Process	N	
61-3	Discussion of Formation of Impurities	N	
62-1	Preliminary Analysis	N	
62-2	Certification of Ingredient Limits	N/A <sup>b</sup>	
62-3	Analytical Methods to Verify the Certified Limits	N/A <sup>b</sup>	
63-2	Color	N	
63-3	Physical State	N	
63-4	Odor	N	
63-5	Melting Point	N/A	
63-6	Boiling Point	N/A	
63-7	Density, Bulk Density or Specific Gravity	N	
63-8	Solubility	N	
63-9	Vapor Pressure	N	
63-10	Dissociation Constant	N/A	
63-11	Octanol/Water Partition Coefficient	N/A	
63-12	pH	N	
63-13	Stability	N	

<sup>a</sup> Y = Yes; N = No; N/A = Not Applicable.

<sup>b</sup> These data are not required for the TGAI, but will be required for individual products after issuance of the RED.

## CHLORINE

### REREGISTRATION ELIGIBILITY DOCUMENT:

### RESIDUE CHEMISTRY CONSIDERATIONS

(Shaughnessy No. 020501; Case No. 4022)

### TASK 2B

#### INTRODUCTION

Chlorine is used as a disinfectant, sanitizer, bacteriostat, microbicide/microbiostat, and algicide on a variety of fruit, vegetable, and seed crops, in food, meat, and poultry processing plant premises, on food, meat, and poultry processing equipment, and in many types of water systems (food processing, pasteurizer/warmer/cannery cooling, pulp/paper mills, swimming pools, human drinking, commercial/industrial cooling, ornamental ponds/aquaria, sewage systems, and lakes/ponds/reservoirs without human and wildlife use).

A Chlorine Residue Chemistry Phase 4 Review was completed 12/2/92.

#### RESIDUE CHEMISTRY CONSIDERATIONS

Chlorine gas is exempt from the requirements for a tolerance when used preharvest or postharvest in solution on all raw agricultural commodities [40 CFR §180.1095]. Since TOX/HED has decided to uphold the current exemption (verbal communication between Marcia van Gemert and Edward Zager 1/13/94), plant metabolism, storage stability, and magnitude of the residue data are not required.

Although chlorinated potable water could result in residues of interest in the edible tissues of livestock, milk, and eggs, most livestock are in rural settings where treated (chlorinated) water is not normally used. CBRS has determined that, even if chlorine is ingested, no reasonable expectation of finite residues [40 §CFR 180.6(c)] or residues significantly above naturally occurring background levels would be incurred in meat, milk, or egg; thus, animal metabolism, storage stability, and magnitude of the residue data are not required.

Although chlorine gas is not specified under 21 CFR §178.1010 as a sanitizer which may be safely used on food processing equipment and utensils, CBRS/HED assumes that chlorine gas when used in solution as a food contact surface sanitizer in or on food, meat, and/or poultry processing premises and/or equipment is under FDA purview and defers to FDA on this subject.

No tolerance/exemption currently exists for the use of chlorine gas in potable water; CBRS/HED has deferred to the Office of Drinking Water responsibility for the determination of the nature and magnitude of the residues of chlorine gas in potable water resulting from the maximum registered uses of chlorine gas.

#### DIETARY EXPOSURE ASSESSMENT SUMMARY

CBRS has no objection to the reregistration of chlorine gas for use on fruit, vegetable, and seed crops. Although chlorine residues of concern may remain in/on fruit, vegetable, and seed crops resulting from currently registered preharvest and postharvest uses of chlorine gas, TOX/HED has decided (verbal communication between Marcia van Gemert and Edward Zager 1/13/94) to uphold the current exemption from the requirements for a tolerance for chlorine residues resulting from preharvest or postharvest uses on all raw agricultural commodities [40 CFR §180.1095]. CBRS/HED has decided that there is no reasonable expectation of finite chlorine residues of concern [40 §CFR 180.6(c)] or residues significantly above naturally occurring background levels in meat, milk, or egg resulting from the currently registered uses of chlorine gas.

CBRS defers the regulation of chlorine gas when used in solution as a food contact surface sanitizer in or on food, meat, and/or poultry processing premises and/or equipment to FDA. CBRS defers the regulation of chlorine gas when used in potable water systems to the Office of Drinking Water along with responsibility for the determination of the nature and magnitude of the residues of chlorine gas in potable water resulting from the maximum registered uses of chlorine gas.