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External Research Program



Environmental Chamber Testing of Emissions from Non-CCA Treated Wood



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**FINAL REPORT -
Environmental Chamber Testing
of Emissions From
Non-CCA Treated Wood**

for

Canada Mortgage and Housing Corporation
Ottawa, Ontario

by

Building Performance

**Manufacturing/
Value-Added Processing Division**

SRC Publication No. 11866-1C05

March, 2005

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Ottawa, Ontario

by

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EXECUTIVE SUMMARY

The main wood preservative used in the recent past in Canada for residential applications is chromated copper arsenate (CCA). CCA-treated wood is used in a wide range of consumer applications and has been in use since the 1940s. Wood preservatives are pesticides and must be registered with the Pest Management Regulatory Agency (PMRA) of Health Canada.

The United States has phased out the use of CCA-treated lumber for residential uses as of January 1, 2004 because of its arsenic content and related negative publicity over the possible health risks as arsenic is a known human carcinogen.

Wood preservatives are broadly classified as either water-based or oil type, depending on the chemical composition of the preservatives and the carrier used during the treating process. The new generation of wood preservatives are water-based and include alkaline copper quaternary (ACQ) (sometimes referred to as ammonium or ammoniacal copper quaternary), copper azole (CBA), and sodium borate (SBX). Creosote, pentachlorophenol, copper naphthenate, and zinc naphthenate are all examples of oil-based preservatives.

This project focussed on volatile organic emissions testing of wood samples using the new and old wood preservatives. Eight treated samples and one untreated sample were tested.

The SRC environmental chamber testing facility was used to conduct the emissions testing. The ASTM Standard D5516-90 "Standard Guide for Small Scale Environmental Chamber Determination of Organic Emissions From Indoor/Material/Products" was used.

Nine different wood samples were tested for volatile organic compound emissions. The specimens included eight treated with different wood preservatives and one untreated wood specimen. Emission factors varied from 366 mg/m².hour to 0.03 mg/m².hour. The highest emission factor was for copper naphthenate with the reason being only one day of conditioning of the product occurred following the application in the laboratory of the liquid. It is expected that the value would be much lower with more conditioning.

The creosote specimen emission factor was second highest. This specimen was of unknown age but assumed to be a minimum of a few years according to the supplier. Degradation of the heavy hydrocarbons is slow resulting in a higher emission factor.

Copper azole (CBA) ranked third highest with the two ACQ products ranked fourth and fifth highest. The zinc naphthenate was next highest (also applied in the laboratory). The untreated wood specimen was ranked seventh highest which was higher than both the sodium borate and CCA specimens.

This testing shows that the untreated wood specimen has measurable volatile organic compounds emissions.

The VOC emissions from water-based preservatives are but one aspect of the possible risks. Other risk factors could include dusts or direct skin contact. These skin and inhalation factors were not examined in this study.

RÉSUMÉ

Le principal produit de préservation du bois qui s'est utilisé à des fins résidentielles au Canada ces dernières années était l'arséniate de cuivre chromaté (ACC). Le bois traité à l'ACC s'employait pour une vaste gamme de produits de consommation depuis les années 1940. Comme il s'agit de pesticides, les produits de préservation du bois doivent être enregistrés auprès l'Agence de réglementation de la lutte antiparasitaire (ARLA) de Santé Canada.

Les États-Unis abandonnent graduellement l'emploi du bois de construction traité à l'ACC depuis le 1^{er} janvier 2004 en raison de sa teneur en arsenic et de la publicité négative connexe entourant les risques pour la santé, vu qu'il s'agit d'une substance cancérigène reconnue.

Les produits de préservation du bois se rangent en grandes catégories selon qu'ils sont à base d'eau ou à base d'huile, compte tenu de la composition des produits de préservation et du solvant employé pendant le procédé de traitement. La nouvelle génération de produits de préservation du bois sont à base d'eau et s'entend du cuivre à l'ammonium quaternaire (ACQ), de l'azole de cuivre (AC) et du borate de sodium (BS). La créosote, le pentachlorophénol, le naphthénate de cuivre (NC) et le naphthénate de zinc (NZ) sont tous des exemples de produits de préservation à base d'huile.

La recherche a porté sur les émissions de composés organiques volatils rejetés par les échantillons de bois traités à l'aide de nouveaux et d'anciens produits de préservation. Huit échantillons traités et un échantillon non traité ont fait l'objet d'essais.

Les essais ont été effectués dans les installations dotées d'une chambre environnementale du SRC, conformément aux dispositions de la norme ASTM D5516-90, « Standard Guide for Small Scale Environmental Chamber Determination of Organic Emissions From Indoor/Material/Products ».

Les essais de rejet d'émissions de composés organiques volatils ont porté sur neuf échantillons de bois différents. Les spécimens en comportaient huit traités avec différents produits de préservation et un non traité. Les émissions variaient de 366 mg/m²•h à 0,03 mg/m²•h. Le naphthénate de cuivre en rejetait le plus, la raison étant que le produit n'avait subi qu'un seul jour de conditionnement après l'application du liquide en laboratoire. On présume qu'avec davantage de conditionnement la valeur serait beaucoup moins élevée.

La créosote arrivait au deuxième rang quant aux rejets d'émissions. L'âge du spécimen était inconnu, mais on a présumé qu'il devait avoir au moins quelques années, d'après le fournisseur. La dégradation des hydrocarbures lourds se fait lentement, entraînant des émissions plus élevées.

L'azole de cuivre (AC) s'est classée au troisième rang, les deux produits traités à l'ACQ se classant quatrième et cinquième. Le naphatéate de zinc venait ensuite (également mis en œuvre au laboratoire). Le spécimen de bois non traité s'est classé septième, rejetant davantage d'émissions que les spécimens traités au borate de sodium et à l'ACC.

Ces essais indiquent que le spécimen de bois non traité enregistrait des émissions mesurables de composés organiques volatils.

Les émissions de COV rejetées par les produits de préservation à base d'eau ne représentent qu'un aspect des risques, les autres étant l'inhalation de poussière et le contact direct avec la peau, sur lesquels l'étude n'a pas porté.



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ABSTRACT

The main wood preservative used in the recent past in Canada for residential applications is chromated copper arsenate (CCA). The United States has phased out the use of CCA-treated lumber for residential uses as of January 1, 2004 because of its arsenic content and related negative publicity over the possible health risks as arsenic is a known human carcinogen.

Wood preservatives are broadly classified as either water-based or oil type, depending on the chemical composition of the preservatives and the carrier used during the treating process. This project focused on volatile organic emissions testing of wood samples using the new and old wood preservatives. Eight treated samples and one untreated sample were tested. The SRC environmental chamber testing facility was used to conduct the emissions testing. The ASTM Standard D5516-90 "Standard Guide for Small Scale Environmental Chamber Determination of Organic Emissions from Indoor/Material/Products" was used.

Emission factors varied from 366 mg/m².hour to 0.03 mg/m².hour for the nine specimens.

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Mr. Cliff Baker and Mr. Brad Burmeister, Timber Specialties Company, provided wood samples and provided insight on the wood preservative industry.

Ms. Muzi Fahri and Mr. Pat Moser, SRC Chemical Analysis Laboratory, provided information regarding the sampling for different compounds and conducted the GC/MS analyses.

This project was funded by Canada Mortgage and Housing Corporation (CMHC) under the terms of the External Research Program, but the views expressed are the personal views of the authors and do not represent the official views of CMHC.

1 INTRODUCTION AND BACKGROUND

CCA Wood Preservative

The main wood preservative used in the recent past in Canada for residential applications is chromated copper arsenate (CCA). CCA-treated wood is used in a wide range of consumer applications and has been in use since the 1940s. Wood preservatives are pesticides and must be registered with the Pest Management Regulatory Agency (PMRA) of Health Canada. The corresponding regulator in the United States is the Environmental Protection Agency (EPA).

A 2002 EPA document states that approximately 150 million pounds of CCA wood preservatives were used in the production of pressure-treated wood in 2001.

Preserved wood is used extensively by consumers for residential use in decks, fences, boat docks, gazebos, landscaping, etc. Increasingly, pressure-treated lumber is also being used indoors for bottom plates in walls or more extensively in other applications if moisture or insects are a concern. The use of preservatives in wood provides a barrier to insect damage and fungal decay. Under no circumstances should treated lumber be used where the preservative may become a component of food, i.e., cutting boards or countertops. Treated wood should not be burned in stoves, fireplaces, or open fires (www.cwc.ca/products/treated_wood/preservatives/others.php).

The United States phased out the use of CCA-treated lumber for residential uses as of January 1, 2004 because of its arsenic content and related negative publicity over the possible health risks as arsenic is a known human carcinogen.

The EPA concluded after eight years of study that CCA-treated wood does not pose any significant risk to the public or environment, but the EPA considered any reduction of arsenic to be a good thing. In February of 2002, the EPA announced a voluntary decision by industry to move consumer use of treated lumber products away from a variety of pressure-treated wood that contains arsenic by December 31, 2003, in favour of new alternative wood preservatives. This transition affects virtually all residential uses (play structures, decks, picnic tables, landscaping timbers, residential fencing, patios, and walkways/boardwalks) of wood treated with chromated copper arsenate (CCA).

Existing structures containing CCA-treated wood are not affected by this action.

The Canadian Institute of Treated Wood on their website state "if a parallel decision is reached in Canada by the Pest Management Regulatory Agency, it will be based on the same environmental and market condition that prompted the agreement between the industry and the

EPA in the U.S." In the Canadian Wood Council report to the Canadian Home Builders' Association (CHBA) Technical Research Committee (TRC) of February 20, 2004, it states that CCA is still available for permanent wood foundations.

Non-CCA Wood Preservatives

The public desires reduced use of pesticides while also wanting wood products that last longer. Naturally durable wood such as cedar and redwood is becoming more expensive and scarce so the continued use of preserved wood provides alternative wood products.

Pine is the species of choice for treated wood applications because of its strength and unique ability to accept pressure treatment, but some other species of wood such as Douglas fir and green hemlock are also used.

Several arsenic-free preservatives have been around for years and some have been marketed as low-toxicity alternatives to traditional treated lumber. Wood preservatives are broadly classified as either water-based or oil type, depending on the chemical composition of the preservatives and the carrier used during the treating process. The new generation of wood preservatives are water-based and include alkaline copper quaternary (ACQ) (sometimes referred to as ammonium or ammoniacal copper quaternary), copper azole (CBA), and sodium borate (SBX). Creosote, pentachlorophenol, copper naphthenate, and zinc naphthenate are all examples of oil-based preservatives.

Alkaline Copper Quaternary (ACQ)

ACQ formulations contain copper and a quaternary ammonium compound. Three ACQ Types (B, C, and D) are mentioned in the literature but only two were found for this project (Types C and D). ACQ is marketed under the brand name of ACQ Preserve® or Naturewood® and others. The Canadian Standards Association, the American Wood Council, and major building codes through North America have accepted ACQ-treated wood. The ACQ formulation is used in the United States, Canada, Europe, Japan, Asia, Australia, and New Zealand (www.chemspec.com).

Copper azole

Copper azoles use copper and azoles as the key fungicide ingredients. Copper azoles are sometimes formulated as CBA, which contains copper, boron, and tebuconazole. The boron in CBA-treated wood can leach out and therefore, CBA-treated wood is for applications where the wood is under cover. The active ingredients are dissolved in a solution of ethanolamine/ammonia in water. One CBA product is marketed as Wolmanized Natural Select®.

ACQ and copper azole rely on copper as the primary active ingredient with an organic fungicide (quaternary or azole) to protect copper-tolerant fungi. CCA, ACQ, and CBA preservatives are water-based and react or precipitate in the wood substrate, thus becoming "fixed" and resistant to leaching.

Sodium borate (SBX)

Sodium borate (SBX) uses boron compounds which are water soluble. Brand names include Advance Guard® and Smart Guard® and others. Borates do not become fixed in the wood and thus are readily leached if exposed to rain or wet soil. Thus, borate treated lumber must not be used where it will be in prolonged contact with soil or water, due to the risk of the preservatives being washed out of the wood. It is suitable for framing lumber in new buildings located where there is risk of insects, e.g., termites. It should not be used for decks or other outdoor structures exposed to weathering. When used as sill (bottom) plates in framing, the borate-treated lumber must be separated from concrete by a cell foam gasket. A dye is used in the treating solution so that treated wood can be distinguished from untreated wood.

The Canadian Wood Council Report to the Canadian Home Builders' Association Technical Research Committee of February 20, 2004 stated that "as of December 31, 2003, the new generation of preservatives (ACQ and CA) has been officially registered by Health Canada for residential uses: play structures, decks, picnic tables, landscape timbers, gazebos, fencing, patios, walkways, etc. The Canadian treating industry has made great strides in shifting production to these new preservatives in a short time frame, and retailers have embraced the change: the new treated wood is currently available in retail outlets. CCA, the traditional wood preservative treatment, was not banned; it was withdrawn by the industry from certain uses. CCA-treated wood is still available for permanent wood foundations and many other applications." No mention is made of sodium borate treated wood in this February 20, 2004 report.

The transition away from CCA is proceeding steadily but many consumers and builders and lumber yard staff may not even realize that a major change in the supply of treated wood is occurring. With the retirement of CCA in the United States, the production, availability, and use of the alternative preservative treatments will increase. In Saskatoon, the major type of treated wood available is alkaline copper quaternary (ACQ). The preservatives and the lumber prices are higher for the new generation of treated lumber but it is expected that prices will decrease when treatment mills are fully on-line.

This project focuses on volatile organic emissions testing of wood samples using the new and old wood preservatives. One concern is the safety of the new preservatives regarding airborne contamination.

This study will provide a small database of products and their volatile organic emissions enabling CMHC to provide the public scientific-based data on exposures. Plant-to-plant and product-to-product variations will exist, but these variations are outside the scope of the study. The information/data gained from the chamber testing will provide building scientists/builders/consumers with knowledge of the wood preservatives before using pressure treated lumber.

1 OBJECTIVES

The objective of the project is to measure the volatile organic compound emissions from the various treated wood samples. The information will be limited to results from a limited number of samples but will provide information to building scientists/builders/consumers of the wood preservatives.

2 SCOPE

The original scope of the project was limited to eight samples of preservative-treated lumber that were to be analyzed for emissions. Two samples each of alkaline copper quaternary (ACQ), copper azole (CBA), and sodium borate (SBX) were to be tested. In addition, two samples of chromated copper arsenate (CCA) preservative-treated lumber were to be tested.

Following discussions with the CMHC Project Officer on June 17, 2004, the scope of the project was to remain the same at eight samples of treated lumber to be tested, but the types of preservative-treated lumber were changed.

The CMHC Project Officer had requested pentachlorophenol be tested but no source of the product was located in spite of extensive searching. Similarly, copper dimethyldithiocarbamate (CCDC) was on the June 17 list of products to be tested but no source was found as the only facility using the treatment has been closed. ACQ - Type B was on the list but no source was found. The final list of tests included: One sample each of ACQ - Type C, ACQ - Type D, creosote-treated lumber, copper naphthenate, zinc naphthenate, copper azole, sodium borate, and CCA. One untreated sample of spruce wood was also tested as a control test making a total of nine samples tested. One chamber air sample from each wood product was taken providing a "snapshot" of the emissions.

Retention levels which refer to the amount of preservative that remains in the wood after the treatment is complete, and wood densities are not addressed in this project.

4 METHODOLOGY

Wood samples were obtained from local suppliers and other sources. The samples were obtained from the inner part of a lift rather than from the edge so as to eliminate cross-contamination from other sources. A saw blade that had been cleaned with a four-step process was used to cut appropriate sized specimens.

Specimens were then cut from the larger sample pieces for the proper chamber loading ratio and stored in Tedlar^R bags until conditioning and testing took place. A common loading ratio was used for most of the specimens. Thirty-eight mm x 140 mm (2" x 6") dimension lumber was used for most of the testing as this is a common lumber size. The creosote specimen was round as it was cut from a treated pole.

Identifying sources for some of the samples was time-consuming and difficult. The types of treated lumber to be tested were changed during the project according to the availability. ACQ - Type C, CCA, creosote, copper naphthenate, zinc naphthenate, and the untreated wood sample were obtained locally in Saskatoon. Other samples were obtained after a great deal of phoning, faxing, and e-mailing across North America. The copper azole sample was obtained from Ontario using an independent third party agency. The ACQ - Type D and borate samples were obtained from an Ontario supplier recommended by Dr. Paul Morris of Forintek, Vancouver.

Material Safety Data Sheets (MSDS) were requested from suppliers for each sample type and are presented in Appendix B.

The SRC environmental chamber testing facility was used to conduct the emissions testing. The ASTM Standard D5516-90 "Standard Guide for Small Scale Environmental Chamber Determination of Organic Emissions From Indoor/Material/Products" was used. Chemical analysis was conducted by the SRC Analytical Chemistry Laboratory (CAEAL accredited) using gas chromatography/mass spectrometer (GC/MS) equipment. Depending on the wood treatment, sampling tubes used included Carbotrap (multi-sorbent tube), charcoal tubes, or specific ORBO[®] tubes. The test was a one point measurement after the conditioning period in the chamber.

5 RESULTS

The results of the chamber testing are presented in the following table as total volatile organic compounds (TVOCs) in milligrams per cubic metre (mg/m³). The area of the wood treatment is expressed in square metres (m²). Volatile organic compounds only were measured. No measurements were made of the weight of individual elements in the wood itself, e.g., the weight of the zinc in the zinc naphthenate specimen.

The code used in the following table is:

Table 1: Wood Product Code

Code	Product
1	ACQ - Type C
2	ACQ - Type D
3	Copper naphthenate
4	Creosote
5	Copper azole
6	CCA
7	Sodium borate
8	Zinc naphthenate
9	Untreated wood

The results of the VOC testing are presented in Table 2. Spectra for the gas chromatography runs are presented in Appendix A.

The chamber air exchange rate for all of the testing was controlled at 0.3 air changes per hour. The chamber size for all of the tests was 171 litres or 0.171 cubic metres.

The formula used to calculate the emission factor is:

$$EF = C \times N/L$$

where:

- EF = emission factor, mg/m².hour
- C = equilibrium chamber concentration, milligrams/m³
- N = chamber air exchange rate, ach⁻¹
- L = product loading, m²/m³

The product loading is calculated by dividing the entire treated wood exposed surface area of the product specimen by the chamber volume. The emission factor in Table 3 represents the summation of all identified volatile organic compounds. The TVOC concentration was calculated using the sum of all the masses of the individual chemicals identified in the analysis. The analyst reviewing the GC/MS output for the analysis would identify and quantify all of the significant peaks. Small peaks below the mass detection level were not reported. The analysis reports greater than 95% of all of the volatile mass recovered from the sample.

Table 3: Emission Factors for Tested Wood Product

Product Code	Wood Treatment	TVOC mg/m3	Treated Area m2	Product Loading m2/m3	Emission Factor mg/m2.hour	Ranking (1 =highest)
1	ACQ-C	5.48	0.0732	0.43	3.82	4
2	ACQ-D	3.5	0.0809	0.47	2.22	5
3	Copper naphthenate	270	0.0378	0.22	366.00	1
4	Creosote	80	0.0946	0.55	43.30	2
5	Copper azole	7.72	0.0798	0.47	4.96	3
6	CCA	0.05	0.093	0.54	0.03	9
7	Sodium borate	0.28	0.0821	0.48	0.18	8
8	Zinc naphthenate	1	0.0751	0.44	0.68	6
9	Untreated wood	0.79	0.0742	0.43	0.55	7

Table 2: Treated Wood Samples and Individual Volatile Organic Compound Concentrations

Compound	Concentration, mg/m ³								
	ACQ-C 1	ACQ-D 2	Copper naphth. 3	Creosote 4	CBA 5	CCA 6	SBX 7	Zinc naphth. 8	Untreated 9
Alpha-pinene	4.4				2				0.074
Camphene	0.22				1.8				0.067
Beta-pinene	0.56				0.15				
dl-Limonene	0.21				1.8				
Toluene	0.019		0.01						
Hexanal	0.006								0.037
Tricyclene	0.038				0.31				
C9 - C12 aliphatic hydrocarbons		3.5					0.28	1	
Hydrocarbons				80					
Benzaldehyde	0.008								
Tetramethylbenzene	0.018								0.14
Benzene			<0.002						
Xylene			1.93						
C6-C14 hydrocarbons			267						
Ethylbenzene			0.96						
Naphthalene			0.005						
Acetic acid					0.7	0.05			
Alpha terpinene					0.75				
Gamma terpinene					0.21				0.17
1 - Phellandrene									0.033
Delta Carene									0.17
C10 - C11 aliphatic hydrocarbons									0.1
SUM =	5.48	3.5	270	80	7.72	0.05	0.28	1	0.79

The detection limit was less than 0.05 micrograms (<0.05 ug). Toluene was used as the calibration standard for all analyses in the GC/MS. Totals for TVOC are rounded to three significant digits.

A calibration procedure for the thermal desorption unit (TDU) is performed. The initial calibration of the TDU is done by using the TDU in the preparation mode, where a known concentration of the calibration gas vapour (toluene or other appropriate compound) is loaded onto a clean tube. The tube is then desorbed in the operating mode into the GC/MS system. This calibration check is frequently done during the analysis of the sample tubes as a quality control check. A traveling blank (Carbotrap tube which has not been exposed but stored with the sample tubes) is run with each batch of sample tubes. The linearity of response of the calibration compound is checked by loading increasingly higher levels of the compound onto Carbotraps until nonlinearity occurs. This will indicate the range of concentrations that are useable. A low level reading is also done to check on the lower limit of detection.

The sample tubes are desorbed in the TDU at 300 degrees C for three minutes. The desorption chamber is directly linked to the capillary column in the GC and any eluted compounds are recorded on the total ion chromatogram (TIC). Full scan mass spectra (m/e range 40 - 500) are required for the entire run.

Any peaks in the TIC that have a signal/noise ratio greater than three are recorded and processed through the library search routine for compound identification. Library matches are inspected by the operator to check on the quality of the matches. The software also calculates a quality factor from 0 - 100%. Any compound with >90% quality are considered excellent. For compounds whose mass spectra do not give an excellent match, a code is assigned which indicates the level of confidence of identification (the codes range from 1 to 5). These codes follow the scheme used by other testing agencies.

Many of the compounds detected are naturally occurring from the wood itself. These are part of the resins and substrate of the wood. Their presence or absence in specific samples in these tests are likely related to the type of wood and the degree of drying and curing to which the individual specimens were subjected during their production, shipping, and storage.

The compounds in the table that would originate from the wood include: alpha-pinene, camphene, beta-pinene, dl-limonene, hexanal, tricyclene, acetic acid, alpha-terpinene, gamma-terpinene, phellandrene, and delta-carene. Some of the other detected compounds may also originate from the wood.

The water-soluble preservatives (ACQ, CBA, and SBX) are non-volatile salts which are not expected to have emissions. From the Material Safety Data Sheets in the Appendix, one of the listed hazardous ingredients of ACQ-treated wood is monoethanolamine, a liquid which may be

volatilized. The ACQ specimen types would have a higher emission rate at the time of application but the ammonia would rapidly disappear. Ammonia cannot be detected in the GC/MS analysis. Similarly, copper would not show on the GC/MS analysis as copper is a particulate with no vapour. The odour of ammonia was not discernible on the specimens before testing took place. Sampling and analysis for ammonia, copper, and zinc were not conducted. Copper azole-treated wood contains tebuconazole, a non-volatile solid and a small amount of ammonia.

The low value for the CCA specimen may be partly due to its unknown age or to the fact that the treatment seals the wood.

For the oil-based preservatives, copper and zinc naphthenates are made from naphthenic acids, which occur naturally in petroleum fractions (www.merichem.com/COPPER/main.HTM). Volatile emissions such as naphthalene would be expected from the specimens treated with naphthenate. Naphthalene was found in the copper naphthenate-treated wood. The fact that it was not detected in the zinc naphthenate may be due to the conditions that the specific specimen was exposed to, such as longer storage time or more exposure to heat. Overall, the TVOC for the zinc naphthenate specimen was low possibly due to the above reasons. The copper naphthenate TVOC was higher as the specimen was "fresh" with C6-C14 hydrocarbons representing almost all of the volatiles. The hydrocarbons likely act as the dilutant or carrier to carry the copper to the wood. This is needed as copper in pure form is a crystal and the wood treater needs to get it to a solution by dissolving the copper. It is believed that the mid-range hydrocarbons were the solvent and thus were used to dissolve the copper.

The copper naphthenate and zinc naphthenate were both applied in a fume hood in the laboratory and then placed in the chamber for conditioning. This explains the high value for copper naphthenate as it cured for only one day before the chamber test was conducted. For zinc naphthenate, after one day of conditioning, during chamber testing the sorbent tube was overloaded and the GC/MS shut down. Two more subsequent tests were needed with decreasing air sample volumes before a satisfactory test could be conducted that the GC/MS could handle. Thirty-three days passed from the date of application of the zinc naphthenate (and the three chamber tests) and a successful test.

Creosote, a coal tar product derived from tar produced by the carbonization of bituminous coal, is a complex mixture of aromatic chemicals (see Appendix), many of which would be expected to show up in a GC/MS analysis. Hydrocarbons were detected from the creosote-treated specimen. The age of the creosote-treated wood is unknown, but presumed to be old. The fact that emissions were detected indicates the persistence of the chemicals.

6 DISCUSSION

Table 3 presents the emission factors for products tested and the relative ranking for each with 1 being the highest and 9 being the lowest.

The highest emission factor was for copper naphthenate with the reason being only one day of conditioning of the product occurred following the application in the laboratory of the liquid. It is expected that the value would be much lower with more conditioning.

The creosote specimen emission factor was second highest. This specimen was of unknown age but assumed to a minimum of a few years according to the supplier. Degradation of the heavy hydrocarbons is slow resulting in a higher emission factor.

Copper azole (CBA) ranked 3 with the two ACQ products ranked 4 and 5. The zinc naphthenate was next at 6 (also applied in the laboratory). The untreated wood specimen was ranked 7 which was higher than both the sodium borate and CCA specimens.

This testing shows that the untreated wood specimen has measurable volatile organic compounds emissions.

7 SUMMARY

Nine different wood samples were tested for volatile organic compound emissions. The specimens included eight treated with different wood preservatives and one untreated wood specimen. Emission factors varied from 366 mg/m².hour to 0.03 mg/m².hour.

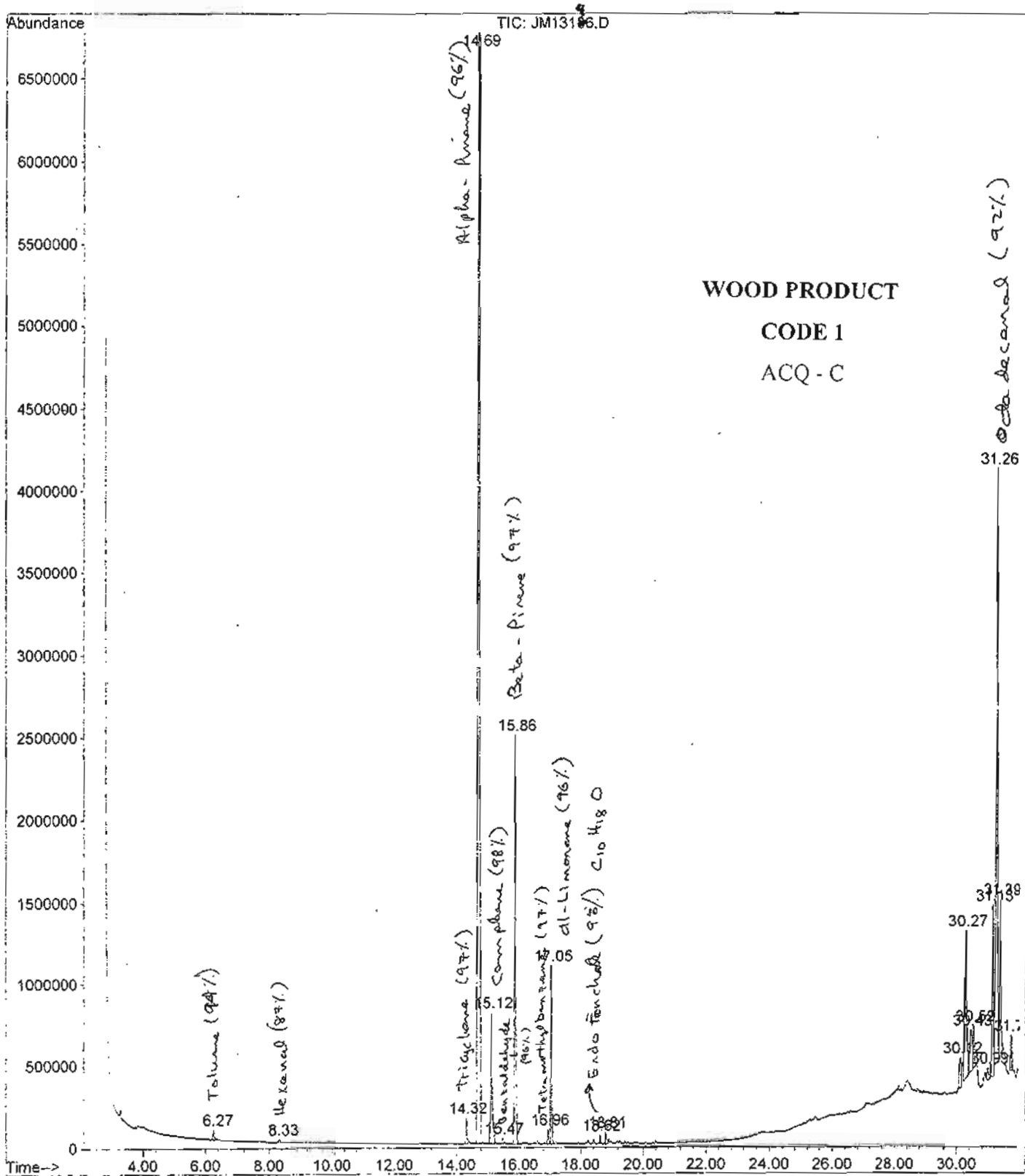
The emissions from the samples treated with water-borne preservatives are due to the aromatic resins from the wood and not the chemical preservatives. The emissions from samples treated with zinc naphthenate and copper naphthenate included naphthalene and aliphatic hydrocarbons. Hydrocarbons were detected from the creosote-treated sample.

This study showed that VOC emissions from the oil-based wood preservatives were detected from wood samples treated with copper naphthenate, zinc naphthenate, and creosote. Higher emissions from the copper naphthenate compared to the zinc naphthenate specimen were due to a shorter curing time. Emissions from creosote were detected from the creosote-treated specimen even though the sample was aged.

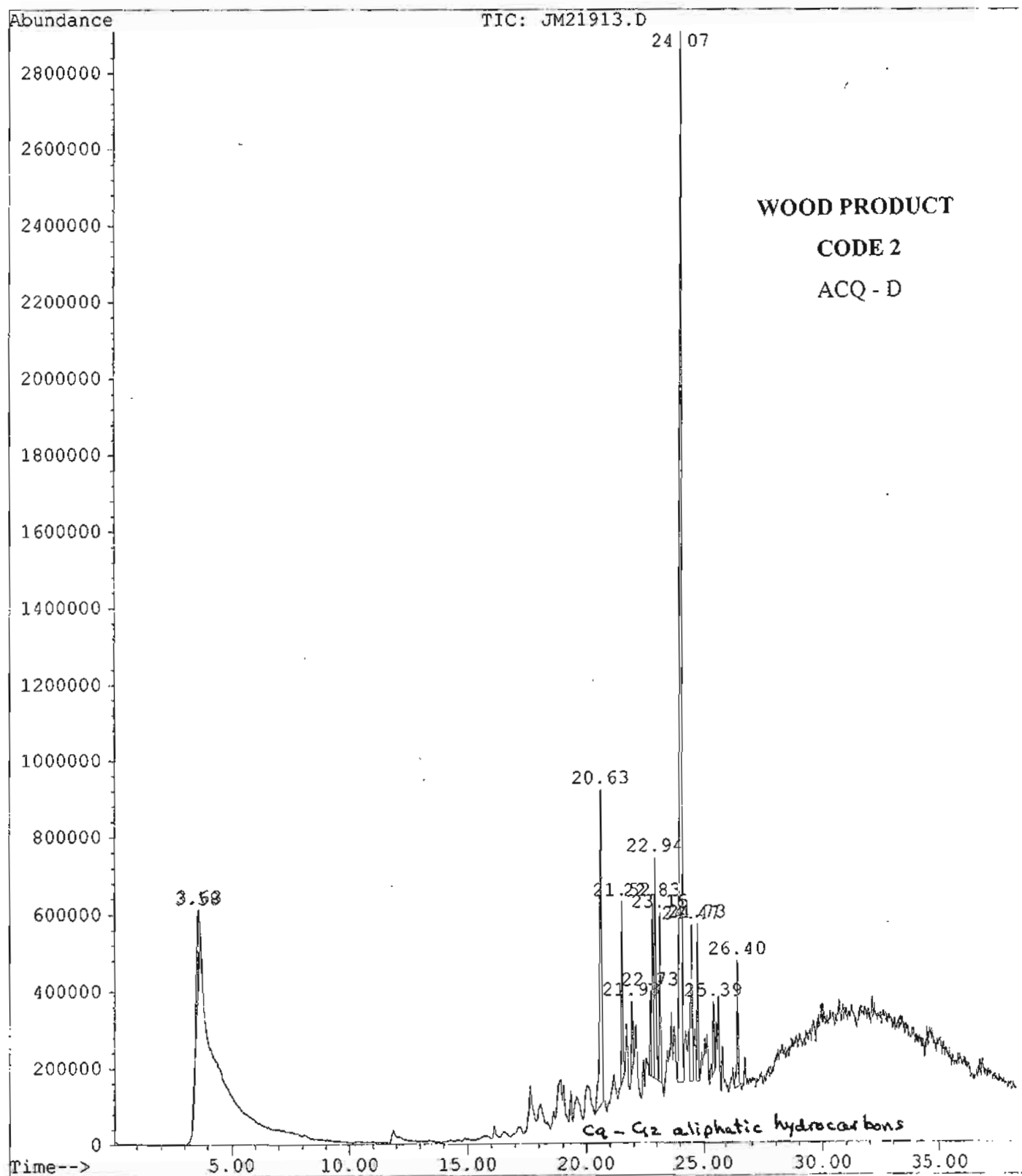
The VOC emissions from water-based preservatives are but one aspect of the possible risks. Other risk factors could include dusts or direct skin contact. These skin and inhalation factors were not examined in this study.

APPENDIX A Gas Chromatography Spectra

File : D:\GLC5\AATEMPR\JM13146.D
 Operator : Pat
 Acquired : 14 Jul 04 15:25 using AcqMethod HYDRO
 Instrument : GC/MS Ins
 Sample Name:
 Misc Info :
 Vial Number: 82

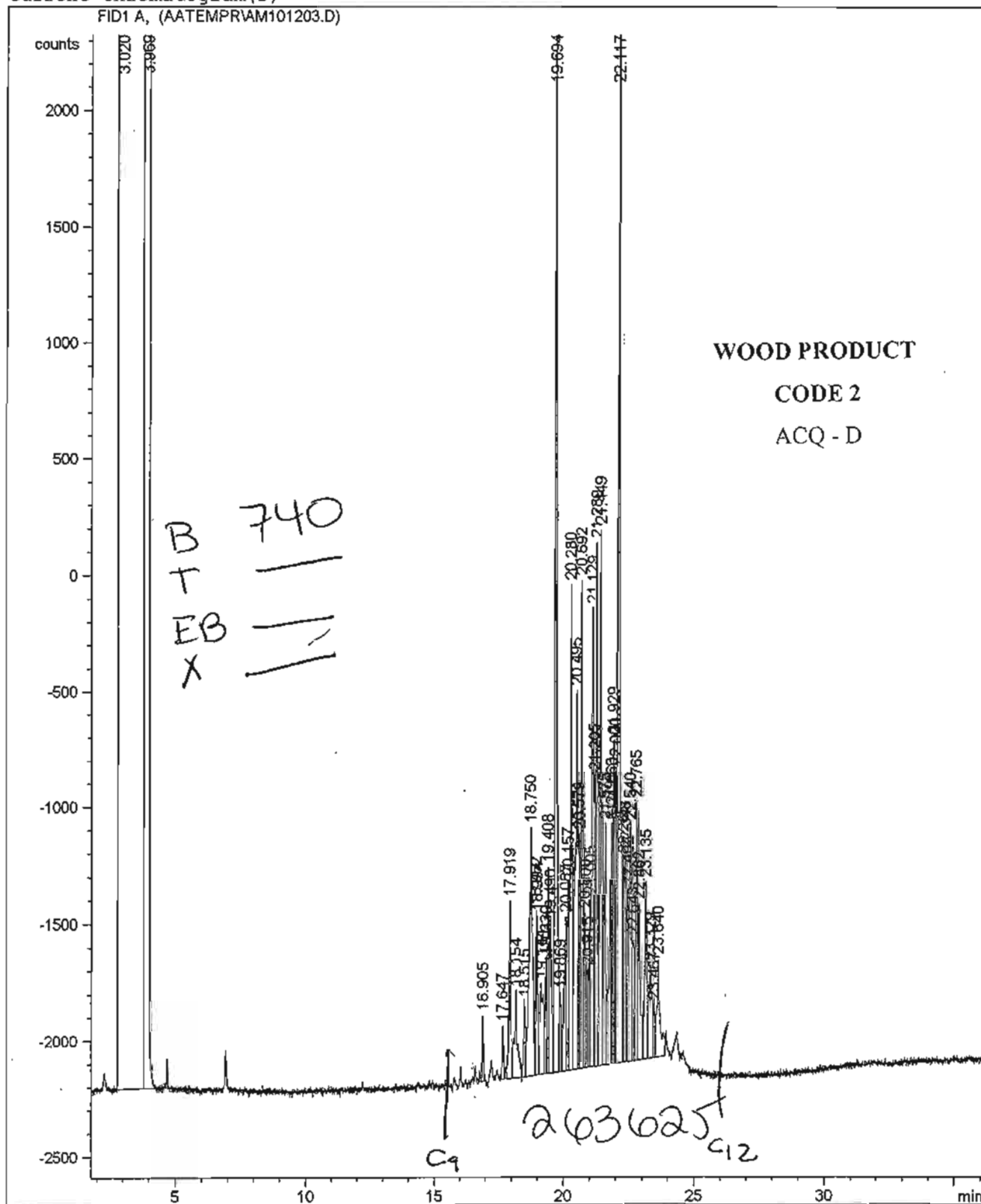


File : D:\CARBOTRA\JM21913.D
Operator : PAT
Acquired : 7 Oct 104 1:26 pm using AcqMethod CARBO.M
Instrument : 5971 MSD
Sample Name: CHMCWOOD 14
Misc Info : GR.5138 J.MAKOHON
Vial Number: 1



Injection Date : 10/12/2004 10:30:00 AM Seq. Line : 3
Sample Name : 21915 Location : Vial 3
Acq. Operator : Ahmed Inj : 1
Inj Volume : 1 µl
Method : C:\HPCHEM\2\METHODS\BTEX.M
Last changed : 7/21/2004 3:57:53 PM by Ashley
BTEX/C6-C12

Current Chromatogram(s)

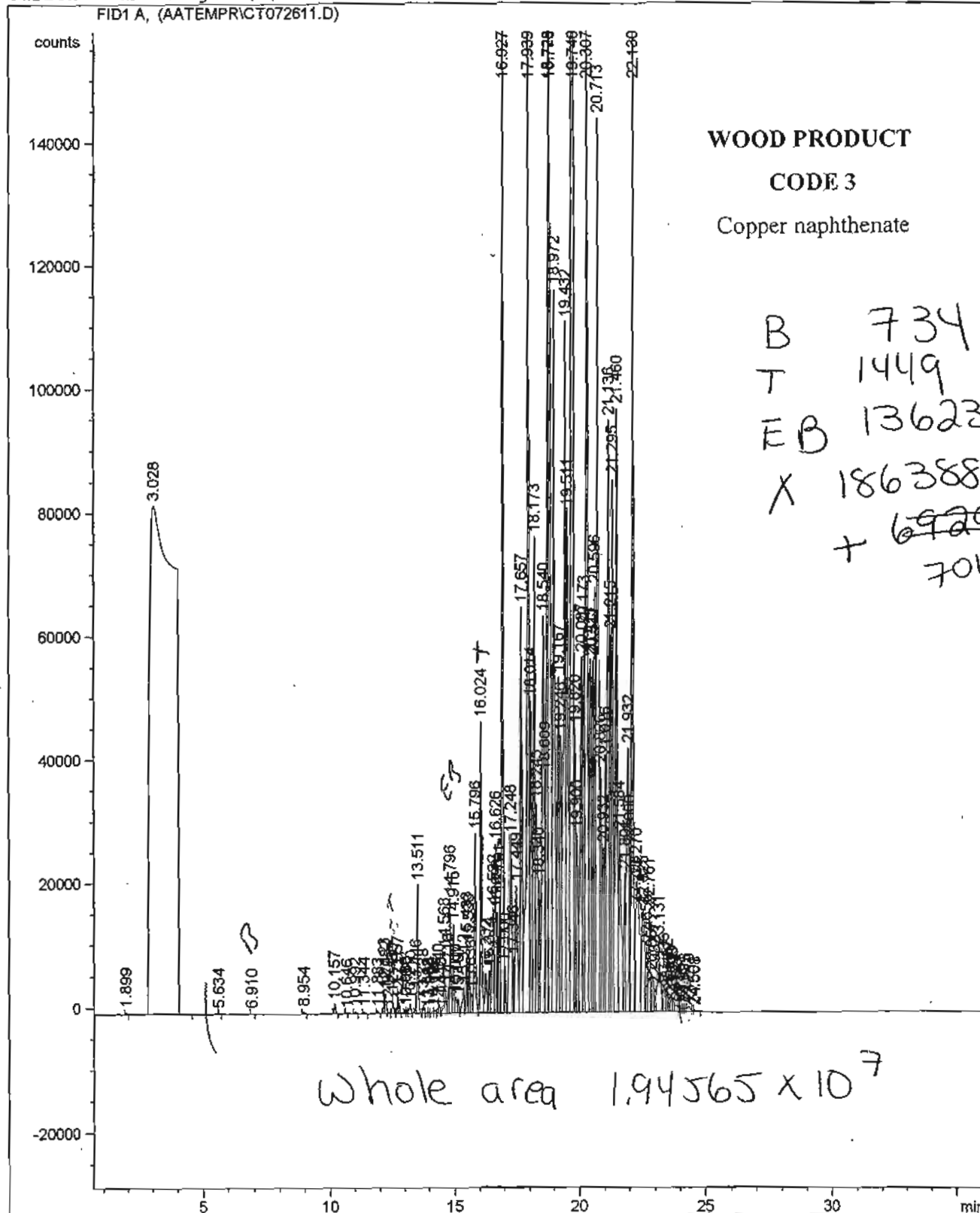


Injection Date : 7/26/2004 6:58:32 PM
 Sample Name : 13953
 Acq. Operator : cindy

Seq. Line : 11
 Location : Vial 11
 Inj : 1
 Inj Volume : 1 µl

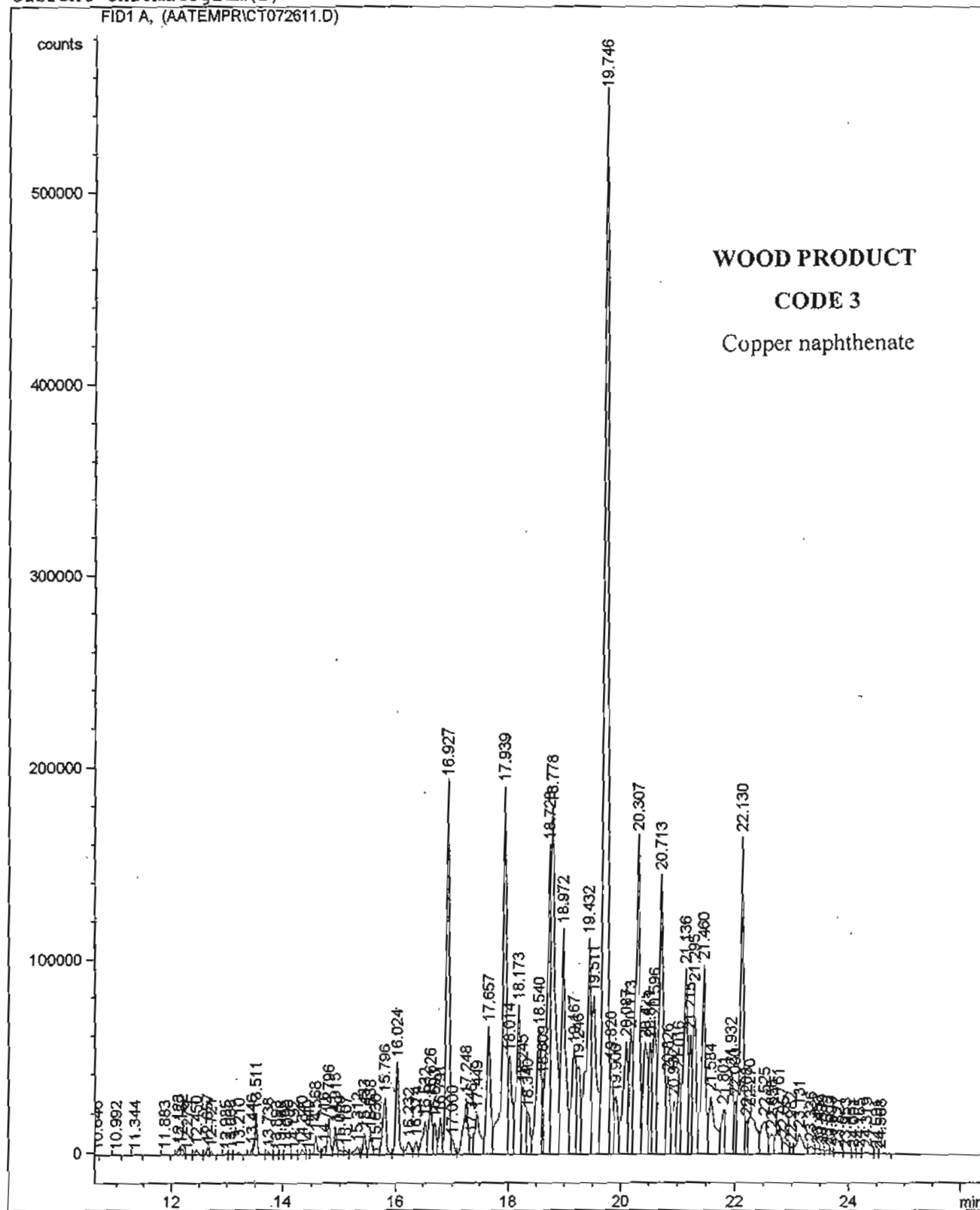
Method : C:\HPCHEM\2\METHODS\BTEX.M
 Last changed : 7/21/2004 3:57:53 PM by Ashley
 BTEX/C6-C12

Current Chromatogram(s)



Injection Date : 7/26/2004 6:58:32 PM Seq. Line : 11
 Sample Name : 13953 (different view) Location : Vial 11
 Acq. Operator : cindy Inj : 1
 Inj Volume : 1 µl
 Method : C:\HPCHEM\2\METHODS\BTEX.M
 Last changed : 7/21/2004 3:57:53 PM by Ashley
 BTEX/C6-C12

Current Chromatogram(s)

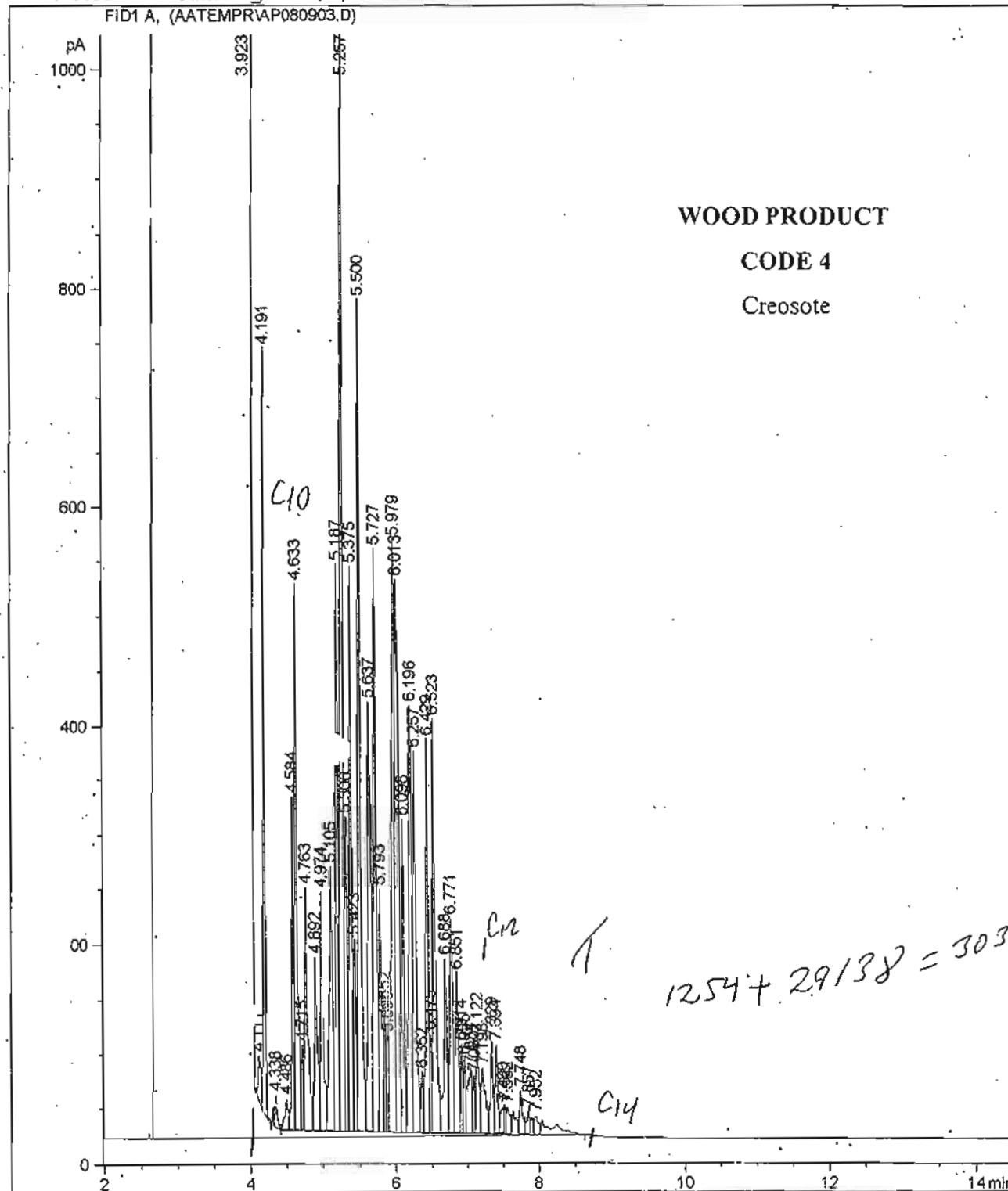


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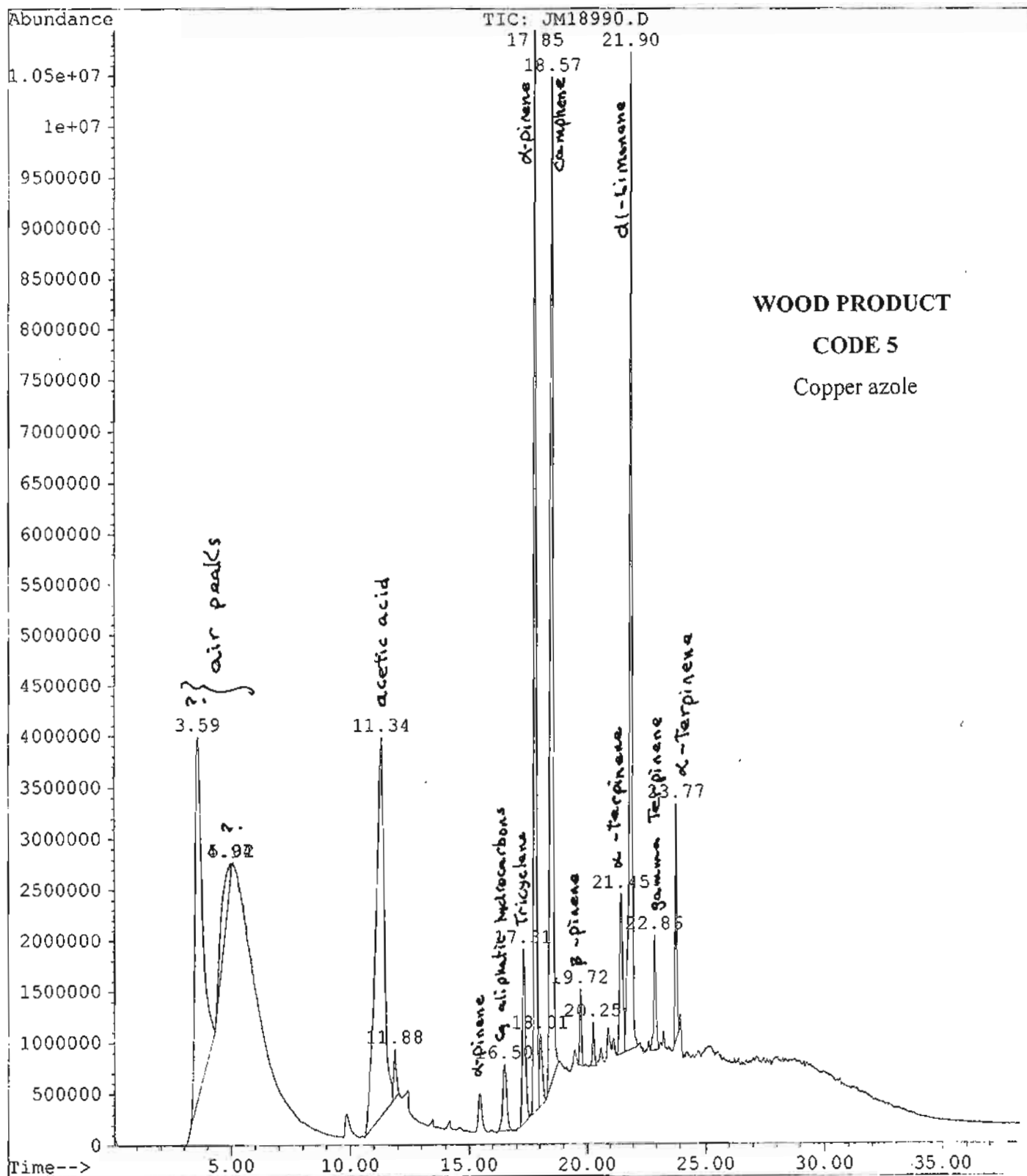
Injection Date	: 8/9/04 6:02:35 PM	Seq. Line	: 3
Sample Name	: 14405	Vial	: 47
Acq. Operator	: Ashley	Inj	: 1
		Inj Volume	: 1 ul

Acq. Method : C:\HPCHEM\4\METHODS\HYDRONEW.M
 Last changed : 8/3/04 4:57:22 PM by Ahmed
 Analysis Method : C:\HPCHEM\4\METHODS\STANDBY.M
 Last changed : 7/26/04 5:02:52 PM by Ahmed
 Standby

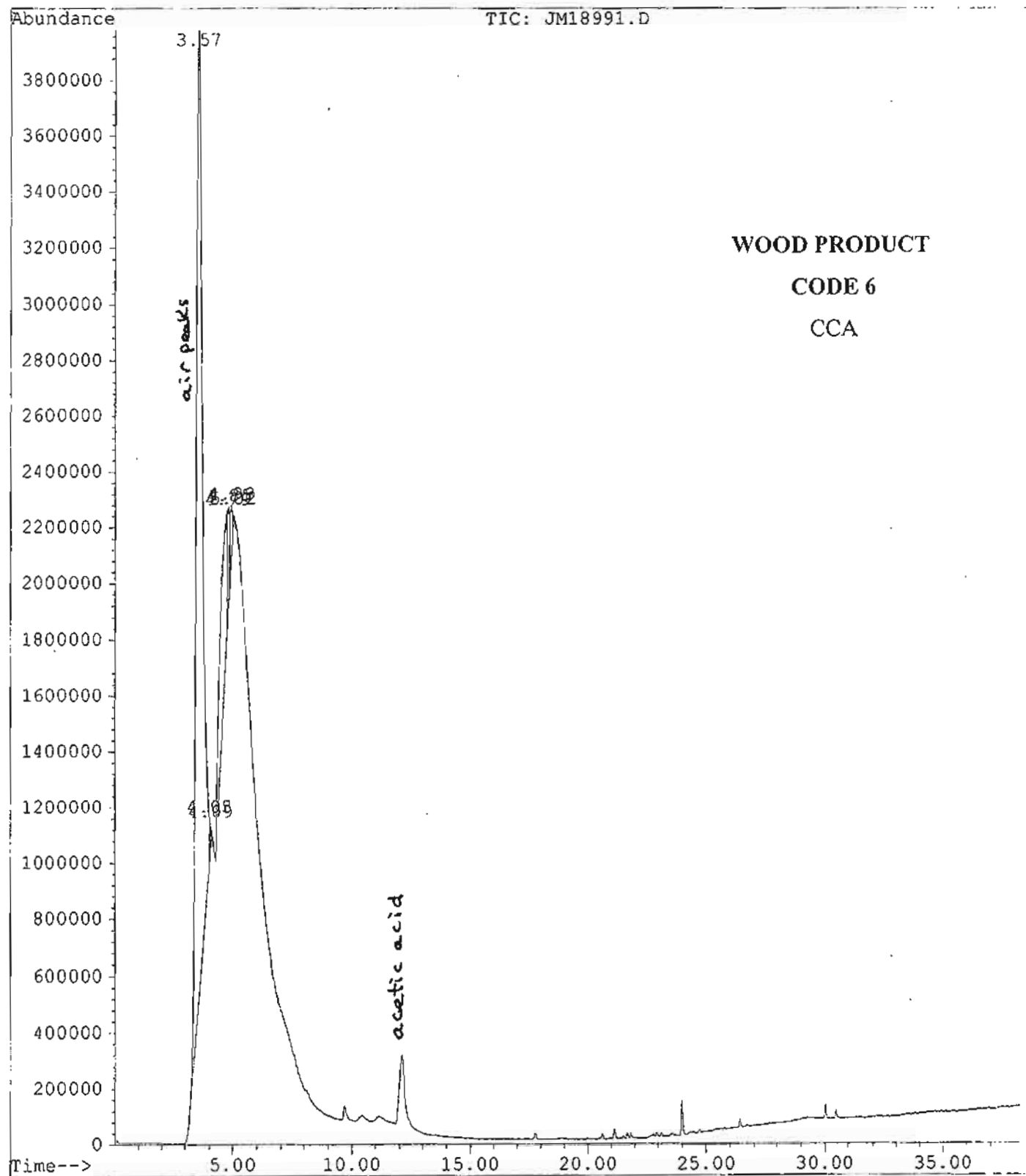
Current Chromatogram(s)



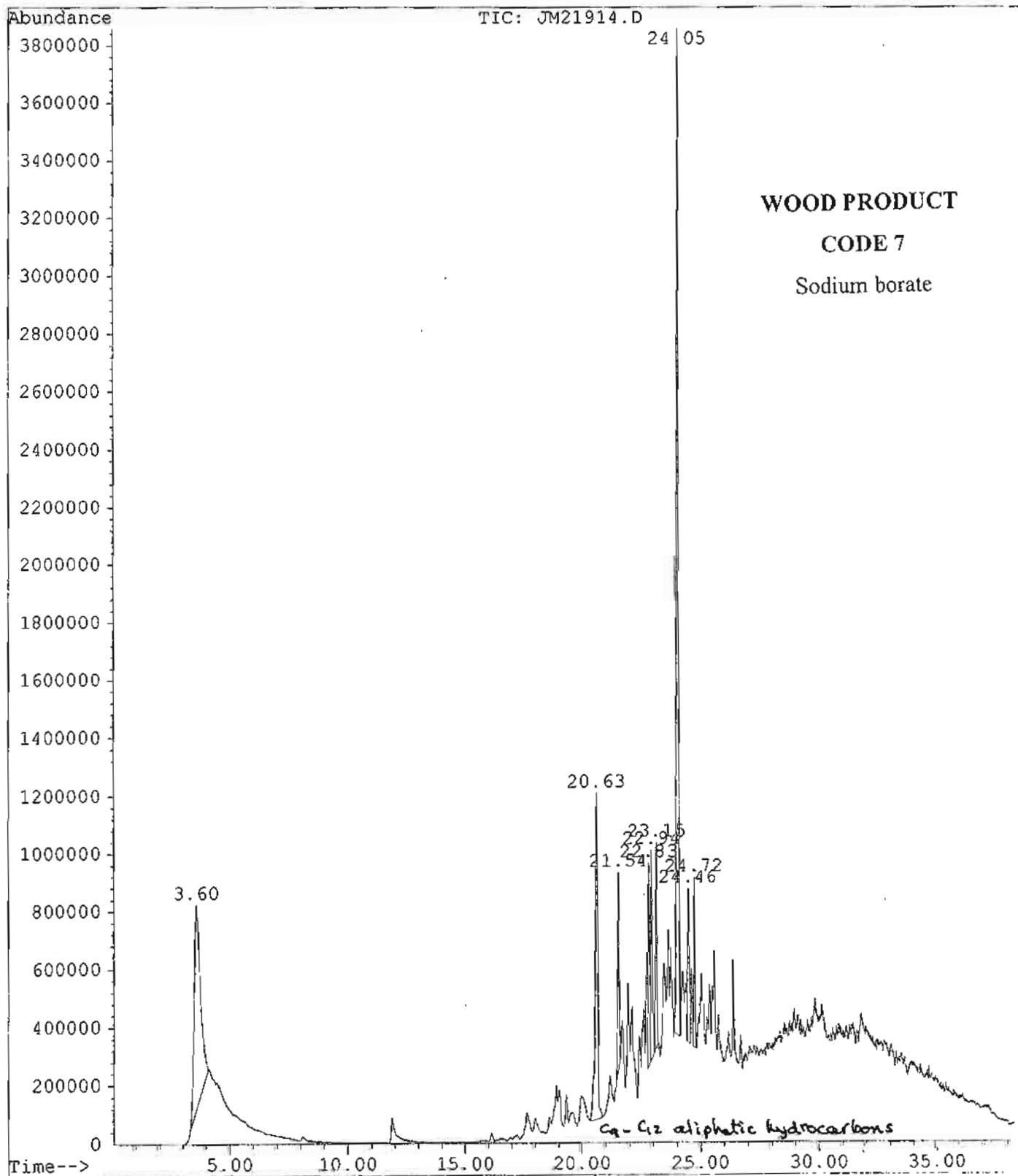
File : D:\CARBOTRA\JM18990.D
Operator : PAT
Acquired : 9 Sep 104 10:37 am using AcqMethod CARBO.M
Instrument : 5971 MSD
Sample Name: CHMCWOOD 10
Misc Info : GR.4530 J.MAKOHON
Vial Number: 1



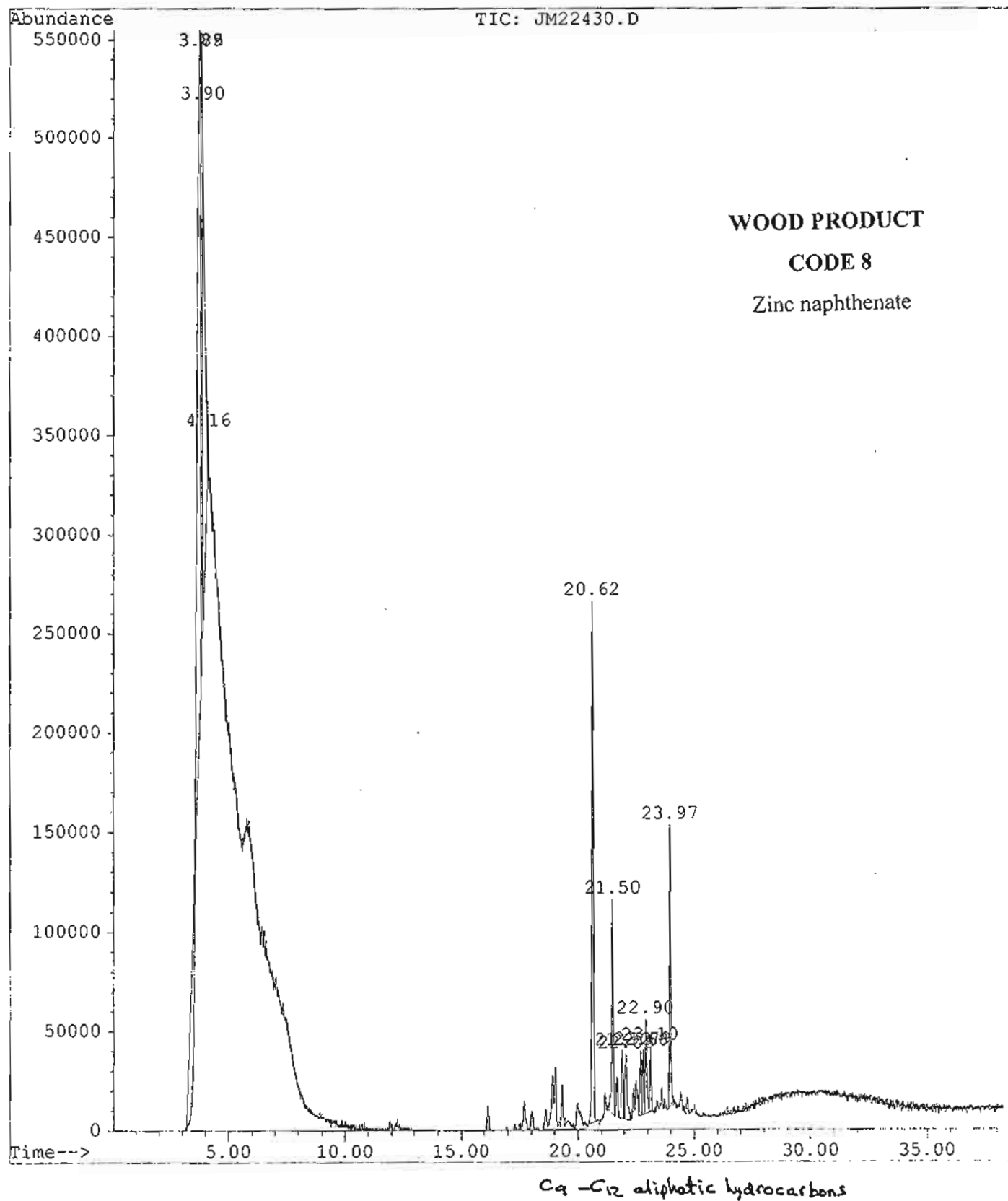
File : D:\CARBOTRA\JM18991.D
Operator : PAT
Acquired : 9 Sep 104 11:26 am using AcqMethod CARBO.M
Instrument : 5971 MSD
Sample Name: CHMCWOOD 11
Misc Info : GR.4530 J.MAKOHON
Vial Number: 1



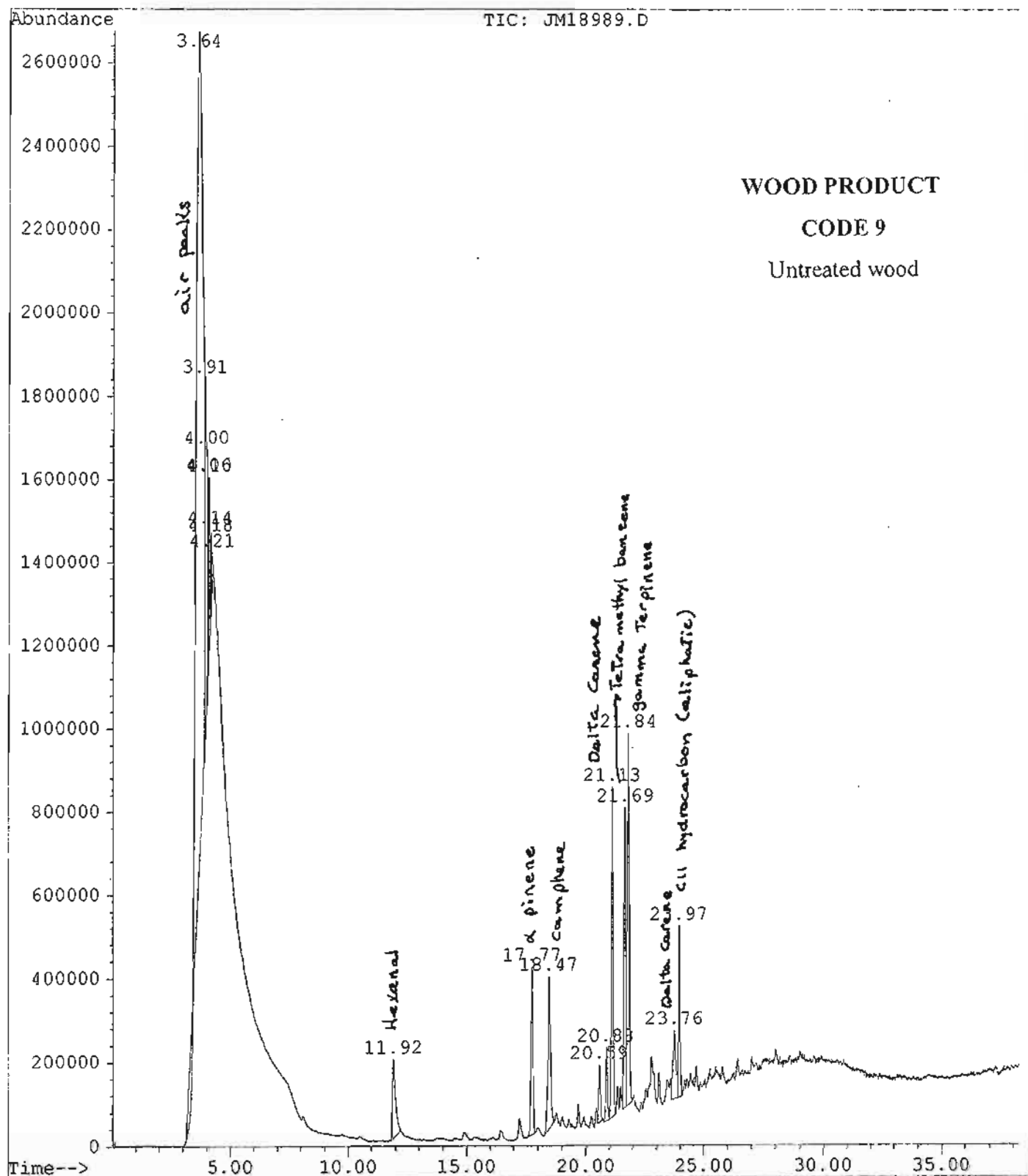
File : D:\CARBOTRA\JM21914.D
Operator : PAT
Acquired : 7 Oct 104 3:17 pm using AcqMethod CARBO.M
Instrument : 5971 MSD
Sample Name: CHMCWOOD 16
Misc Info : GR.5138 J.MAKOHON
Vial Number: 1



File : D:\CARBOTRA\JM22430.D
Operator : PAT
Acquired : 7 Oct 104 4:02 pm using AcqMethod CARBO.M
Instrument : 5971 MSD
Sample Name: CHMCWOOD 17
Misc Info : GR.5251 J.MAKOHON
Vial Number: 1



File : D:\CARBOTRA\JM18989.D
Operator : PAT
Acquired : 9 Sep 104 9:07 am using AcqMethod CARBO.M
Instrument : 5971 MSD
Sample Name: CHMCWOOD 9
Misc Info : GR.4530 J.MAKOHON
Vial Number: 1



*Confidential Report To
Canada Mortgage and Housing Corporation*

*Final Report -
Environmental Chamber Testing of Emissions
From Non-CCA Treated Wood*

APPENDIX B Material Safety Data Sheets

Osmose MATERIAL SAFETY DATA SHEET

MATERIAL SAFETY DATA SHEET: **NATUREWOOD**
Amine Based Treated Wood

SECTION I

MSDS NUMBER:	177-osm
MSDS CODE:	OSM
SYNONYMS:	N/A
MANUFACTURED BY:	Licensees/Customers of Osmose, Inc.
DIVISION:	WPD
EPA REGISTRATION NUMBER:	N/A
VENDOR:	N/A
EMERGENCY PHONE:	716-882-5905
OTHER CALLS:	770-228-8434
ADDRESS:	980 Ellicott Street, Buffalo, NY 14209
MSDS PREPARED BY:	Teri Muchow
DATE PREPARED:	August 31, 2001
DATE LAST REVISED:	August 11, 2003

ADDITIONAL INFORMATION

CHEMTREC'S EMERGENCY TELEPHONE NUMBER IS TO BE USED ONLY IN THE EVENT OF CHEMICAL EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT INVOLVING CHEMICALS.

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

TRADE NAME: NatureWood					
INGREDIENT NAME	CAS	OSHA PEL	ACGIH TLV	OTHER	%
Wood/Wood Dust	N/A	5 mg/m ³ TWA	5 mg/m ³ TWA 10 mg/m ³ STEL	N/A	90 - 98%
Monoethanolamine	141-43-5	3 ppm TWA 6 mg/m ³ TWA	3 ppm TWA 6 ppm STEL	N/A	0.8 - 5.5%
Copper complex expressed as Copper Oxides	Proprietary	0.1 mg/m ³ TWA (fume)	0.2 mg/m ³ TWA (fume)	N/A	0.3 - 2.1
Alkyl dimethyl benzyl ammonium chloride*	68391-01-5	N/A	N/A	N/A	0.2 - 1.0%
Didecyl dimethyl ammonium chloride*	7173-51-5	N/A	N/A	N/A	0.2 - 1.0%
Didecyl dimethyl ammonium carbonate and Didecyl dimethyl ammonium bicarbonate*	Proprietary	None Established	None Established	N/A	0.2 - 1.0%

*Note: This product contains one of the above Quaternary ammonium compounds depending on which preservative is used at the treating plant.

PERCENTAGE OF ACTIVE INGREDIENTS PER RETENTION LEVEL

	0.15 pcf	0.25 pcf	0.40 pcf	0.60 pcf
Copper complex expressed as Copper Oxides	0.27	0.45	0.72	1.07
Alkyl dimethyl benzyl ammonium chloride*	0.14	0.22	0.36	0.53
Didecyl dimethyl ammonium chloride*	0.14	0.22	0.36	0.53
Didecyl dimethyl ammonium carbonate and Didecyl dimethyl ammonium bicarbonate*	0.14	0.22	0.36	0.53
Wood Dust**	86.60	86.37	86.02	85.56

- *NOTE: This product contains one of the above quaternary ammonium compounds depending on which preservative is used at the treating plant.
- ** This represents the maximum amount of wood dust that could be generated if the wood was completely machined.

SECTION III - CHEMICAL CHARACTERISTICS

BOILING POINT	MELTING POINT	FREEZING POINT	SPECIFIC GRAVITY (H ₂ O = 1)	PERCENT VOLATILE BY VOLUME	THEORETICAL VOC CONTENT (PERCENT OF WEIGHT)
Not Applicable	Not Applicable	Not Applicable	Not Available	Not Applicable	Not Applicable

Osmose MATERIAL SAFETY DATA SHEET

WEIGHT PER GALLON Not Applicable	pH: Not Applicable	VAPOR PRESSURE Not Applicable	VAPOR DENSITY Not Applicable	DENSITY Not Available	EVAPORATION RATE BASIS (N-BUAC) = 1 Not Applicable
SOLUBILITY IN WATER: Not Applicable			REACTIVITY IN WATER: Not Applicable		
APPEARANCE AND ODOR. Solid Wood, appearance may vary; ammoniacal wood odor..					

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT N/A	METHOD N/A	FLAMMABLE LIMITS IN AIR (%) N/A	AUTOIGNITION TEMPERATURE N/A
NFPA CODES	HEALTH 1	HMIS CODES:	HEALTH 1
	FLAMMABILITY 1		FLAMMABILITY 1
	REACTIVITY 0		REACTIVITY 0
	OTHER N/A		PROTECTION B
EXTINGUISHER MEDIA: Use water to wet down wood and to reduce the likelihood of ignition or dispersion of dust into the air.			

SPECIAL FIRE FIGHTING PROCEDURES: Firefighters should wear full protective clothing including self-contained breathing apparatus. Combustion products may yield irritating and toxic fumes and gases including organic chloride, aldehydes, amines, hydrogen chloride, ammonia, copper compounds, oxygen, boric oxide, oxides of carbon and nitrogen.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Wood is combustible, and wood dusts may form explosive mixtures with air in the presence of an ignition source.

SECTION V - REACTIVITY DATA

IS THIS CHEMICAL STABLE UNDER NORMAL CONDITIONS OF HANDLING/STORAGE (Y/N)? Yes

CONDITIONS TO AVOID (REGARDING STABILITY): Keep away from excessive heat, sparks and open flame. Keep away from incompatible materials.

INCOMPATIBILITY (MATERIALS TO AVOID): Strong acids, alkalis and oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Combustion products may yield irritating and toxic fumes and gases including organic chloride, aldehydes, amines, hydrogen, ammonia, copper compounds, oxygen, boric oxide, oxides of carbon and nitrogen.

HAZARDOUS POLYMERIZATION POSSIBLE (Y/N)? No

CONDITIONS TO AVOID (REGARDING POLYMERIZATION): N/A

SECTION VI - HEALTH HAZARDS

EMERGENCY OVERVIEW: WARNING! Wood dust may form explosive mixture with air. Wood dusts may cause irritation to the eyes, skin and respiratory tract.

ROUTES OF ENTRY: Dermal, Inhalation.

SIGNS AND SYMPTOMS OF ACUTE OVEREXPOSURE:

EYES:	Wood dust may cause irritation to the eyes. Symptoms can include irritation, redness, scratching of the cornea, and tearing.
SKIN:	Wood dust may cause irritation to the skin. Mechanical rubbing may increase skin irritation. Some wood species may cause dermatitis or allergic skin reactions in sensitized individuals.
INGESTION:	Ingestion of wood or wood dust is unlikely. If ingestion does occur, slight gastrointestinal irritation may result. Certain species of wood and their dusts may contain natural toxins, which can have adverse effects in humans.
INHALATION:	Wood dust is irritating to the nose, throat and lungs. Symptoms may include nasal dryness, deposits or obstructions in the nasal passages, coughing, sneezing, dryness and soreness of throat and sinuses, hoarseness, and wheezing. Prolonged or repeated inhalation of wood dusts may cause respiratory irritation, recurrent bronchitis and prolonged colds. Some species may cause allergic respiratory reactions with asthma-like symptoms in sensitized individuals. Prolonged exposure to wood dusts by inhalation has been reported to be associated with nasal and paranasal cancer.

CHRONIC OVEREXPOSURE: Prolonged exposure to wood dusts by inhalation has been reported to be associated with nasal and paranasal cancer. Some wood species may cause dermatitis or allergic skin reactions in sensitized individuals.

CHEMICAL LISTED AS A CARCINOGEN OR POTENTIAL CARCINOGEN?: NatureWood and its components are not listed as carcinogens by ACGIH, NIOSH, or IARC. ACGIH, NIOSH and IARC classify wood dust as a human carcinogen or occupational carcinogen. This classification is based on an increased incidence of nasal and paranasal cancers in people exposed to wood dusts.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Pre-existing eye, respiratory system and skin conditions.

TOXICITY:

Osmose MATERIAL SAFETY DATA SHEET

Monoethanolamine (CAS #141-43-5) Oral LD50 Rat: 1720 mg/kg Oral LD50 Mouse: 700 mg/kg Dermal LD50 Rabbit: 1 mg/kg IDLH: 30 ppm	Copper complex (expressed as Copper oxides) Oral LD50 Rat: 1350 mg/kg Inhalation LC50 Rat: 2000 ppm/4H Dusts as mists as Cu: 100 mg/m3 IDLH (related to copper)
Boric Acid (CAS #10043-35-3) Oral LD50 Rat: 2660 mg/kg Oral LD50 Mouse: 3450 mg/kg	Alkyl Dimethyl benzyl ammonium chloride (CAS #68391-01-5) Oral LD50 Rat: 735 mg/kg for males and females combined Dermal LD50 Rat: 3350 mg/kg for males and females combined
Didecyl dimethyl ammonium chloride (CAS #7173-51-5) Oral LD50 Rat: 84 mg/kg Oral LD50 Mouse: 266 mg/kg	Didecyl dimethyl ammonium carbonate and Didecyl dimethyl ammonium bicarbonate* (CAS Proprietary) Oral LD50 (rat): 245 mg/kg Skin Irritation (rabbit): Corrosive Photosensitization (Guinea pig): Not a sensitizer or photoallergen

EMERGENCY AND FIRST AID PROCEDURES

① EMERGENCY PHONE NUMBER OF MANUFACTURER: 716-882-5905

- 1. INHALATION:** If dusts are inhaled, remove person to fresh air. If symptoms persist, get medical attention.
- 2. EYE CONTACT:** Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention if symptoms persist.
- 3. SKIN CONTACT:** For skin contact, wash immediately with soap and water. Continue flushing skin with water for 15 minutes. If irritation persists, get medical attention. If wood splinters are injected under the skin, get medical attention immediately.
- 4. INGESTION:** If the material is swallowed, get immediate medical attention or advice – Do not induce vomiting.

NOTE TO PHYSICIAN: Respiratory ailments and pre-existing skin conditions may be aggravated by exposure to wood dust.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

US DOT SHIPPING DESCRIPTION: Not regulated.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Do not generate airborne dusts in the presence of an ignition source when sawing, cutting or grinding wood. Wash hands after handling and before eating. Avoid contact of wood dusts with skin and eyes. Do not breathe wood dusts. Do not eat, drink or smoke when handling this material or in areas where dusts of this product are present.

OTHER PRECAUTIONS: Maintain good housekeeping procedures, such as sweeping regularly to avoid accumulation of dusts. Store away from excessive heat, sparks and open flame.

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: No containment procedures are needed as this product cannot spill or leak the preservative. Keep away from sparks and flame. Wear appropriate protective equipment and clothing during clean-up. Wet down accumulated dusts prior to sweeping or vacuuming in order to prevent explosion hazards. Sweep up or vacuum small pieces and dusts and place in appropriate container for disposal. Gather larger pieces by an appropriate method. Avoid the generation of airborne dusts during clean up. Do not inhale dusts during clean up.

WASTE DISPOSAL METHODS: Although no EPA Waste Numbers are applicable for this product's components, you must test your waste to determine if it meets applicable definitions of hazardous waste and for State requirements. Dispose of waste material according to local, State and Federal regulations.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: Not normally needed. Use a dust mask for particulate concentrations exceeding the Occupational Exposure Limit.

VENTILATION REQUIREMENTS: Use exhaust ventilation when cutting, grinding or sanding in enclosed areas and if it is anticipated the exposure limits for wood dust may be exceeded during working with this product.

PROTECTIVE GLOVES: Wear puncture resistant work gloves, such as leather.

EYE PROTECTION: Wear safety glasses with side shields when handling, cutting, sanding or grinding this material. Use a face shield during processes that may generate excessive dusts and splinters.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Eye wash fountain is recommended.

WORK/HYGIENIC PRACTICES: Launder work clothes frequently.

SECTION IX - ECOLOGICAL INFORMATION

ECOTOXICITY: This product is not expected to leach harmful amounts of preservative into the environment. However, the wood preservatives in this product contain fungicides and insecticides, which when released into the environment, are expected to adversely effect or destroy contaminated plants. They may be harmful or fatal to wildlife.

Osmose MATERIAL SAFETY DATA SHEET

COMPONENT ANALYSIS:

Monoethanolamine (CAS #141-43-5)	
LC50 (96 hr) goldfish: 170.0 mg/l	
EC50 (30 min) Photobacterium phosphoreum: 13.7 mg/l Microtox test	
Boric Acid (CAS #10043-35-3)	
LC50 (48hr) water flea: 115.0 – 153.0 mg/l (static conditions)	
Copper Complex (Proprietary)	
LC50 (96hr) fathead minnow: 23 ug/L (20 mg CaCO3/L)	LC50 (96hr) water flea: 10 ug/L (45 mg CaCO3/L)
LC50 (96hr) rainbow trout: 13.8 ug/L (juveniles)	LC50 (96hr) water flea: 200 ug/L (226 mg CaCO3/L
LC50 (96hr) bluegill: 236 – 892 ug/L (adults – related to copper)	– related to copper)
LC50 (72hr) freshwater algae: 120 ug/L (related to copper)	
Didecyl dimethyl ammonium carbonate and Didecyl dimethyl ammonium bicarbonate* (CAS Proprietary)	
LC50 (rainbow trout – 96 hour – Static): 0.810 mg/l	EC50 (Daphnia magna – 48 hour – Static): 0.073 mg/l
LC50 (bluegill sunfish – 96 hour – Static/Renewal): 0.28 mg/l	LC50 (mysid shrimp – 96 hour – static): 0.066 mg/l
LC50 (Sheepshead Minnow – 96 hour Static/Renewal): 1.110 mg/l	

ENVIRONMENTAL FATE: No information available

SECTION X - REGULATORY INFORMATION:

SARA/TITLE III:

SECTION 302:

N/A

SECTION 304:

N/A

SECTION SECTION 312 - HAZARD CATEGORIES:

Immediate (Acute) Health: No



































Reactive Hazard: No

Delayed (Chronic) Health: No

Sudden Release of Pressure: No

Fire Hazard: No

HAZARDOUS MATERIALS INFORMATION SYSTEM (HMIS) PERSONAL PROTECTION INDEX

A 	H    
B  	I   
C   	J    
D   	K    
E   	X Ask your supervisor for guidance
F    	
G   	

N/A = Not Applicable

NOTICE: The information herein is given in good faith but no warranty, expressed or implied, is made, and Osmose, Inc. expressly disclaims liability from reliance on such information.

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Consumer Safety Information Sheet

Alkaline Copper Quaternary (ACQ)

USE | HANDLING | INSTALLATION AND MAINTENANCE | DISPOSAL

The active ingredient in ACQ is copper, which has long been established as an effective biocide in timber preservation. Quat acts as the co-biocide in the ACQ preservative, providing additional protection from fungi and insect attack that copper alone would not control. Quats are commonly used in household and industrial disinfectants and cleaners and are biodegradable in soil. Copper and quat solutions similar to ACQ are used for the control of fungi and bacteria in swimming pools and spas.

ACQ preservatives penetrate into and remain in pressure-treated wood for a long time. However, some preservative may migrate from the preserved wood into surrounding soil over time and there may be incidental contact with skin during construction or use.

Follow the safe practices listed below when working with pressure-treated wood. Specific work practices may vary depending on the environment and safety requirements of individual jobs.

Use

Wood pressure-treated with ACQ preservatives may be used inside residences as long as all sawdust and construction debris are cleaned up and disposed of after construction.

Do not use treated wood under circumstances where the preservative may become a component of food or animal feed. Examples of such sites would be structures or containers for storing silage or food.

Do not use treated wood for cutting boards or countertops.

Only use treated wood that's visibly clean and free from surface residue for patios, decks and walkways.

Do not use treated wood for construction of those portions of beehives that may come in contact with honey.

Do not use treated wood where it may come in direct or indirect contact with public drinking water, except for uses involving incidental contact such as docks and bridges.

Do not use treated wood for mulch.

Handling

Wear gloves to protect against splinters.

Wear a dust mask when machining any wood to reduce the inhalation of wood dusts. Avoid frequent or prolonged inhalation of sawdust from treated wood. Machining operations should be performed outdoors whenever possible to avoid indoor accumulations of airborne sawdust.

Wear appropriate eye protection to reduce the potential for eye injury from wood particles and flying debris during machining.

Wash exposed areas thoroughly with mild soap and water after working with treated wood.

If preservative or sawdust accumulates on clothes, launder before reuse. Wash work clothes separately from other household clothing.

Installation and Maintenance

All cuts and holes that expose untreated wood should be liberally brush coated with an endcut preservative before wood is installed.

For best results, hot dipped galvanized or stainless steel fasteners and fittings are recommended. Direct contact of ACQ treated wood with aluminum is not recommended.

ACQ treated lumber can be painted or stained with any high quality oil or latex based paint or stain. Water repellent coatings can be applied to improve the weathering performance. It is important to ensure the wood is dry and free from surface deposits prior to applying any coating. Always use products in accordance with manufacturers instructions.

Disposal

Do not burn treated wood. Preserved wood should not be burned in open fires, stoves or fireplaces.

Residential users may dispose of treated wood scraps and cut offs by ordinary trash collection or burial. Commercial and industrial users of treated wood should dispose of ACQ treated wood scraps and cut offs in accordance with local, provincial and federal regulations.

[HOME](#) | [ACQ](#) | [CCA](#) | [CA](#)

[FRANÇAIS](#)



Effective Date: 03/01/2002
Supersedes Date: NEW

*** Section 1 – Product and Company Identification ***

Product Name: ACQ Pressure Treated Wood & Lumber

Synonyms: ACQ Treated, ACQ Treated Wood, ACQ Type D

Product Names: Preserve® and Preserve® Plus

Product Use:

A pressure treated wood with Alkaline Copper and Quaternary Ammonium Compounds. The preserved wood is arsenic-free and protects wood from rot, decay and termite attack. Applications include: decks, fences, landscape architecture, playground equipment, docks, marinas, utility poles, bridges, highway sound barriers, roller coasters, wood foundations and mine shafts.

Manufacturer Information:

Georgia-Pacific Corporation
133 Peachtree Street, N.E.
Atlanta, GA 30303

Phone: (404)652-5119
Emergency #: 1-800-424-9300 (Chemtrec)

*** Section 2 – Composition / Information on Ingredients ***

Alkaline Copper and Quaternary Ammonium (ACQ) Components:

CAS #	Component	Percent*	OSHA (PEL)	ACGIH (TLV)
68391-01-5	Alkyl dimethyl benzyl ammonium chloride**	0.2 - 1.0	Not Established	Not Established
10043-35-3	Boric Acid	0.2 - 1.2	Not Established	Not Established
Proprietary	Copper complex expressed as copper oxides	0.3 - 2.1	1 mg/m ³ (As Cu)	1 mg/m ³ (As Cu)
141-43-5	Monoethanolamine	0.8 - 5.5	3 ppm TWA 6 ppm STEL	3 ppm TWA 6 ppm STEL
Not Applicable	Hardwoods		5 mg/m ³ TWA 10 mg/m ³ STEL	1 mg/m ³ TWA
Not Applicable	Softwoods		15 mg/m ³ (Total Dust) 5 mg/m ³ (Respirable)	5 mg/m ³ TWA 10 mg/m ³ STEL

**Contains either one or the other of the above Quaternary ammonium compounds depending on which ACQ Wood Preservative is used.

*** Section 3 - Hazards Identification ***

EMERGENCY OVERVIEW

CAUTION: Sawing, sanding or machining wood products can produce wood dust, which can cause an explosion hazard. Wood dust may cause irritation to the eyes, skin and respiratory tract.

Target Organ: Eye, Skin and Respiratory Tract

Potential Health Effects:

Potential Health Effects: Inhalation

Wood dust may cause nasal dryness, irritation, coughing and sinusitis. Repeated exposure can produce allergic responses in sensitive individuals

Potential Health Effects: Eye Contact

Wood dust can cause mechanical irritation.

Potential Health Effects: Skin Contact

Various species of wood dust may evoke allergic contact dermatitis in sensitive individuals. If an allergy pre-exists or develops, it may be necessary to remove the sensitized worker from further exposure to wood dust or wood based products.

Potential Health Effects: Ingestion

Not applicable under normal conditions of use. Dislodging residue from the wood surface to the hands may increase exposure by incidental ingestion.

Medical Conditions Aggravated

Wood dust exposure may aggravate pre-existing skin, eye, respiratory and cardiovascular disorders.

HMIS Ratings: Health: 1* Fire: 1 Reactivity: 0 Personal Protection: B
(Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 * = Chronic)

*** Section 4 - First Aid Measures ***

First Aid: Inhalation

Remove to fresh air immediately. If breathing is difficult, trained personnel should administer oxygen. If breathing has ceased apply artificial resuscitation using oxygen and a suitable mechanical device such as a bag and a mask. Get immediate medical attention.

First Aid: Eyes

Immediately rinse with water. Remove contact lenses. Hold eyelids apart and flush eyes with water for at least 15 minutes. If irritation persists, seek medical attention.

First Aid: Skin

Wash affected area with soap and water until dust is entirely removed from skin. Immediately remove contaminated clothing. If rash, dermatitis or irritation persists, seek medical attention. Launder contaminated clothing before reuse or dispose of properly.

First Aid: Ingestion

Not applicable under normal conditions of use.

*** Section 5 – Fire Fighting Measures ***

FLASH POINT: Not Applicable

EXPLOSIVE LIMITS:

Sawing, sanding or machining wood products can produce wood dust as a by-product. Wood dust is a strong to severe explosion hazard if a dust "cloud" contacts an ignition source. 212°F (100°C) has been suggested as the upper temperature limit for continuous exposure for wood without risk of ignition (wood dust may require still a lower temperature). An airborne concentration of 40 grams of dust per cubic meter of air is often the lower explosion limit (LEL) for wood dust.

HAZARDOUS COMBUSTION PRODUCTS:

Thermal-oxidative degradation, or burning of wood can produce irritating and potentially toxic fumes and gases including carbon monoxide, aldehydes and organic acids.

AUTOIGNITION TEMPERATURE:

400° - 500°F (204° - 260°C)

FIRE EXTINGUISH MEDIA:

Water, carbon dioxide or sand.

SPECIAL FIRE FIGHTING PROCEDURE:

Use water to wet down wood dust to reduce the likelihood of ignition or dispersion of dust into the air. Remove burned, charred or wet dust to open, secure area after fire is extinguished.

NEPA Ratings: Health: 1 Fire: 1 Reactivity: 0

(Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4)

*** Section 6 – Accidental Release Measures ***

Accidental Release:

Not applicable for product in purchased form.

Clean-Up Procedures:

Wood dust may be vacuumed or shoveled for recovery or disposal. Wet down accumulated dusts prior to vacuuming or shoveling in order to prevent explosion hazards. Avoid dusty conditions and provide good ventilation. Wood dust clean up and disposal activities should be accomplished in a manner to minimize creation of airborne dust. Do not inhale dusts during clean up.

*** Section 7 – Handling and Storage ***

Handling Procedures

Avoid repeated or prolonged breathing of wood dust. Avoid eye contact and repeated or prolonged contact with skin. Change protective clothing and gloves when sign of contamination appear.

Storage Procedures

Wood products are combustible and, therefore, should not be subjected to temperatures exceeding the autoignition temperature. Water spray may be used to wet down wood dust generated by sawing, sanding or machining to reduce likelihood of ignition or dispersion of dust into the air.

*** Section 8 – Exposure Controls / Personal Protection ***

ENGINEERING CONTROLS:

Due to the explosive potential of wood dust when suspended in air, precautions should be taken during sanding, sawing or machining of wood products to prevent sparks or other ignition sources in ventilation equipment. Use of totally enclosed motors is recommended. Provide local exhaust as necessary to meet OSHA requirements for wood dust exposure.

PERSONAL PROTECTION EQUIPMENT (PPE):

(PPE RECOMMENDATIONS BELOW: IT MAY BE NECESSARY TO FOLLOW PPE REQUIREMENTS AS DETERMINED BY YOUR WORKPLACE)

Personal Protective Equipment: Respiratory

Use NIOSH approved respirator where ventilation is not possible and if permissible exposure limits to wood dust may be exceeded.

Personal Protective Equipment: Eyes/Face

Recommend goggles or safety glasses as conditions indicate when sawing, sanding or machining wood products.

Personal Protective Equipment: Skin

Protective equipment, such as gloves and outer garments may be needed to reduce skin contact. After working with the wood, and before eating, drinking, toileting and use of tobacco products, wash exposed areas thoroughly.

Other Protective Clothing or Equipment:

No special requirements under normal conditions of use. Protective clothing should be worn where prolonged skin contact may occur. Protective clothing should be laundered separately from household clothing and before reuse.

*** Section 9 – Physical & Chemical Properties ***

Appearance: Varies
Physical State: Solid
Vapor Pressure: Not Applicable
Boiling Point: Not Applicable
Solubility (H2O): Insoluble

Odor: Ammonium/Woody Odor
pH: Not Applicable
Vapor Density: Not Applicable
Melting Point: Not Applicable
Specific Gravity: <1.0%

*** Section 10 – Chemical Stability & Reactivity Information ***

Chemical Stability

This is a stable material.

Conditions to Avoid

Wood dust generated from sawing, sanding or machining the product is extremely combustible. Keep in cool dry place away from ignition sources.

Incompatibility (Materials to Avoid)

Strong acids, alkalis oxidizing agents and drying oils.

Hazardous Decomposition or By-Products

Thermal decomposition products include organic chloride, aldehydes, amines hydrogen chloride, ammonia, copper compounds, oxygen, boric oxide, oxides of carbon and nitrogen. The metals may remain in the ash if the wood is burned.

Hazardous Polymerization

Will not occur.

*** Section 11 – Toxicological Information ***

Wood Dust: Wood dust generated from sawing, sanding or machining this product may cause nasal dryness, irritation, coughing and sinusitis. The International Agency for Research on Cancer (IARC) and the National Toxicology Program (NTP) classify wood dust as a (known) human carcinogen (Group I). This classification is based primarily on increased risk in the occurrence of adenocarcinomas of the nasal cavities and paranasal sinuses associated with exposure to wood dust. The evaluation did not find sufficient evidence to associate cancers of the oropharynx, hypopharynx, lung, lymphatic and hematopoietic systems, stomach, colon or rectum with exposure to wood dust.

Acute and Chronic Toxicity\Carcinogenicity\Chronic Toxicity

A: General Product Information

No data available for the product in purchased form.

Additional data can be found for the individual components listed in Section 2.

B: Component Analysis - LD50/LC50

No data available for the product in purchased form.

Toxicological values have been published for the individual components listed in Section 2.

C: Component Carcinogenicity

No data available for the product in purchased form.

ACQ components are not listed by IARC, OSHA, or NTP.

Other Toxicological Information

No data available for the product in purchased form.

*** Section 12 – Ecological Information ***

Ecotoxicity

A: General Product Information

This product is not expected to leach harmful amounts of preservative into the environment. However, the wood preservatives in this product contain fungicides and insecticides which when released into the environment, are expected to adversely effect or destroy contaminated plants. They may be harmful or fatal to wildlife.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Aquatic values have been published for the individual components listed in Section 2.

Environmental Fate

No information available.

***** Section 13 – Disposal Considerations *****

US EPA Waste Number & Descriptions

A: General Product Information

If the material is altered by processing, use or contamination the waste must be tested using methods described in 40 CFR 261 to determine if it meets applicable definitions of hazardous wastes.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

In its purchased form, dispose of treated wood by ordinary trash collection. Treated wood should not be burned in open fires or in stoves, fireplaces or residential boilers because toxic chemicals may be produced as part of the smoke and ashes. Treated wood from commercial or industrial use (e.g. construction sites) may be burned only in commercial or industrial incinerators or boilers in accordance with state and federal regulations.

***** Section 14 – Transportation Information *****

US DOT Information

This product is not a DOT hazardous material

Canadian - Transportation of Dangerous Goods (TDG)

This product is not listed as a hazardous material.

***** Section 15 – Regulatory Information *****

US Federal Regulations

A: General Product Information

This product is pressure treated with either of three FIFRA registered wood preservatives. These preservatives fall under the Environmental Protection Agency regulations:

ACQ 2100	EPA Registration Number	10465-37
ACQ 2101	EPA Registration Number	10465-40
ACQ 2102	EPA Registration Number	10465-39

Wood products are not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200. However, wood dust generated by sawing, sanding or machining these products may be hazardous.

Additional information on treated wood and lumber and links to the EPA website(s) may be found at www.preservedwood.com or www.treatedwood.com

B: Component Analysis

This product in its purchased form does not contain SARA identified chemicals.

The individual components listed in Section 2, may be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4):

Copper complex expressed as Copper oxides (Proprietary)

SARA 313: form R reporting required for 1.0% de minimis concentration (related to Copper)
form R reporting required for 1.0% de minimis concentration; Chemical Category N100

C: Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)

This product contains the following chemical present on either the Listing of Pesticide Chemical 40 CFR 180 or Pesticides Classified for Restricted use as listed by FIFRA:

Copper Complex (Proprietary)

FIFRA Section Number 180.538 (related to copper)

D: Marine Pollutant

This product contains chemicals required by US DOT to be identified as marine pollutants:

Copper Complex (Proprietary)

SARA 311/312: **Acute Health: YES Chronic Health: YES**

Fire: YES Pressure: No Reactive: No

State Regulations

A: General Product Information

Other state regulations may apply. Check individual state requirements.

B: Component Analysis - State

The following individual components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Copper Complex (related to copper)	Proprietary	Yes	Yes	Yes	Yes	Yes	Yes
Monoethanolamine	141-43-5	Yes	Yes	Yes	Yes	Yes	Yes
Wood Dust	Not Applicable	No	No	No	Yes	No	Yes

(MN) Yes Related to wood dust, all soft and hard woods

(PA) Yes Related to wood dust, soft woods

A: Component Analysis - Inventory

Component	CAS #	TSCA	DSL
Alkyl dimethyl benzyl ammonium chloride**	68391-01-5	Yes	Yes
Boric Acid	10043-35-3	Yes	Yes
Copper complex	Proprietary	Yes	Yes
Copper complex expressed as copper oxides	Proprietary	Yes	No
Monoethanolamine	141-43-5	Yes	Yes

B: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Boric Acid	10043-35-3	1%; English Item 1096; French Item 1170
Copper complex expressed as copper oxides	Proprietary	1%; English Item 433; French Item 578 (related to Copper, elemental) 1%; English Item 431; French Item 577 (related to copper compounds, n.o.s.)
Monoethanolamine	141-43-1	1%; English Item 1096; French Item 1170

***** Section 16 – Other Information *****

Label Text

ACQ PRESSURE TREATED WOOD AND LUMBER

CAUTION!

WOOD DUST CAN CAUSE A FLAMMABLE OR EXPLOSION HAZARD.

WOOD DUST MAY CAUSE LUNG, UPPER RESPIRATORY TRACT, EYE AND SKIN IRRITATION. THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) AND THE NATIONAL TOXICOLOGY PROGRAM (NTP) LIST WOOD DUST AS A (GROUP 1) CARCINOGEN.

PRECAUTIONS

Never burn treated lumber.
Avoid dust contact with ignition source.
Avoid frequent or prolonged inhalation of wood dust.
Protect eyes from flying particles.
Avoid contact from skin and wash exposed areas.
Change protective clothing and gloves when needed.

FIRST AID

If inhaled, remove to fresh air. In case of contact, flush eyes and skin with water. If irritation persists, seek medical attention.

HANDLING AND STORAGE

Avoid frequent or prolonged inhalation of wood dust. Protect eyes from flying particles. Avoid contact with skin and wash exposed areas thoroughly. Change protective clothing and gloves when sign of contamination appear.

Wood products are combustible and, therefore, should not be subjected to temperatures exceeding the autoignition temperature. Water spray may be used to wet down wood dust generated by sawing, sanding or machining to reduce likelihood of ignition or dispersion of dust into the air.

For additional information, see the Georgia-Pacific Material Safety Data Sheet for this product.

Product Safety and Health Information
Georgia-Pacific Corporation
133 Peachtree Street, N.E. (30303)
P. O. Box 105605
Atlanta, GA 30348-5605

Additional Resources Include:

EPA Website Links: www.epa.gov/pesticides/citizens/1file.htm
1-800-282-0500 (1-800 Build GP) or www.gp.com

IMPORTANT: The information and data herein are believed to be accurate and have been compiled from sources believed to be reliable. It is offered for your consideration, investigation and verification. Buyer assumes all risk of use, storage and handling of the product in compliance with applicable federal, state and local laws and regulations. Georgia-Pacific and its subsidiaries make no warranty of any kind, expressed or implied, concerning the accuracy or completeness of the information and data herein. The implied warranties of merchantability and fitness for a particular purpose are specifically excluded. Georgia-Pacific and its subsidiaries will not be liable for claims relating to any party's use of or reliance on information and data contained herein regardless of whether it is claimed that the information and data are inaccurate, incomplete or otherwise misleading.

Key/Legend:

ACGIH	American Conference of Governmental Industrial Hygienists
C	Ceiling Limit
CAS	Chemical Abstract Services Number
CFR	Code of Federal Regulations
DOT	Department of Transportation
DSL	Domestic Substance List
EPA	Environmental Protection Agency
HEPA	High Efficiency Particulate Air
HMIS	Hazardous Material Identification System
IARC	International Agency for Research on Cancer
LCLo	Lowest Concentration in Air Resulting in Death
LC50	Concentration in Air Resulting in Death to 50% of Experimental Animals
LDLo	Lowest Dose Resulting in Death
LD50	Administered Dose Resulting in Death to 50% of Experimental Animals
NA	Not Available or Not Applicable
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NJTSR	New Jersey Trade Secret Registry
NSL	Non-Domestic Substance List
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
STEL	Short term exposure limit
TCLo	Lowest Concentration in Air Resulting in a Toxic Effect
TDLo	Lowest Dose Resulting in a Toxic Effect
TDG	Canadian Transportation of Dangerous Goods
TLV	Threshold Limit Value
TSCA	Toxic Substance Control Act
TWA	Time Weighted Average
WHIMS	Workplace Hazardous Materials Information System

This is the end of MSDS #33Q (ACQ Pressure Treated Wood and Lumber)

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format) For Cornell University Convenience Only

COPPER NAPHTHENATE, WOOD PRESERVATIVE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Composition/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification COPPER NAPHTHENATE, WOOD PRESERVATIVE

Product Identification: COPPER NAPHTHENATE, WOOD PRESERVATIVE

Date of MSDS: 01/01/1987 **Technical Review Date:** 08/20/1986

FSC: 8030 **NIIN:** 00-282-0971

Submitter: N EN

Status Code: C

MFN: 01

Article: N

Kit Part: N

Manufacturer's Information

Manufacturer's Name: BAIRD & MCGUIRE, INC

Post Office Box: 369

Manufacturer's Address1: 775 SOUTH ST

Manufacturer's Address2: HOLBROOK, MA 02343-1328

<http://msds.ehs.cornell.edu/msds/msdsdod/a40/m19730.htm>

1/13/2005

Manufacturer's Country: US
General Information Telephone:
Emergency Telephone: N/P
Emergency Telephone: N/P
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: EO566
Special Project Code: N

Item Description

Item Name: N/A
Item Manager: NK
Specification Number: NK
Type/Grade/Class: NK
Unit of Issue: NK Quantitative Expression: NK
Unit of Issue Quantity: NK
Type of Container:

Contractor Information

Contractor's Name: BAIRD & MCGUIRE, INC.
Post Office Box: 369
Contractor's Address1: UNKNOWN
Contractor's Address2: UNKNOWN, NK 00000
Contractor's Telephone: UNKNOWN
Contractor's CAGE: EO566

Contractor Information

Contractor's Name: BAIRD AND MCGUIRE INC
Post Office Box: 369
Contractor's Address1: 775 SOUTH ST
Contractor's Address2: HOLBROOK, MA 02343-1328
Contractor's Telephone: UNKNOWN
Contractor's CAGE: 96397

Section 2 - Composition/Information on Ingredients COPPER NAPHTHENATE, WOOD PRESERVATIVE

Ingredient Name: COPPER NAPHTHENATE
Ingredient CAS Number: 1338-02-9 Ingredient CAS Code: M
RTECS Number: QK9100000 RTECS Code: M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:

% Low Volume: % Low Volume Code:
 % High Volume: % High Volume Code:
 % Text: N/P
 % Environmental Weight:
 Other REC Limits: N/P
 OSHA PEL: N/P OSHA PEL Code:
 OSHA STEL: OSHA STEL Code:
 ACGIH TLV: N/P ACGIH TLV Code:
 ACGIH STEL: N/P ACGIH STEL Code:
 EPA Reporting Quantity:
 DOT Reporting Quantity:
 Ozone Depleting Chemical: N

Ingredient Name: SOLVENTS
 Ingredient CAS Number: Ingredient CAS Code: X
 RTECS Number: RTECS Code: X
 =WT: =WT Code:
 =Volume: =Volume Code:
 >WT: >WT Code:
 >Volume: >Volume Code:
 <WT: <WT Code:
 <Volume: <Volume Code:
 % Low WT: % Low WT Code:
 % High WT: % High WT Code:
 % Low Volume: % Low Volume Code:
 % High Volume: % High Volume Code:
 % Text: 70.0
 % Environmental Weight:
 Other REC Limits: N/P
 OSHA PEL: N/P OSHA PEL Code:
 OSHA STEL: OSHA STEL Code:
 ACGIH TLV: 500 PPM (MFG) ACGIH TLV Code: M
 ACGIH STEL: N/P ACGIH STEL Code:
 EPA Reporting Quantity:
 DOT Reporting Quantity:
 Ozone Depleting Chemical:

Section 3 - Hazards Identification, Including Emergency Overview COPPER NAPHTHENATE, WOOD PRESERVATIVE

Health Hazards Acute & Chronic: N/P

Signs & Symptoms of Overexposure:
 ANESTHETIC. POSSIBLE EYE & SKIN IRRIT

Medical Conditions Aggravated by Exposure:
 N/P

LD50 LC50 Mixture: N/P

Route of Entry Indicators:
 Inhalation: N/P
 Skin: N/P

Ingestion: N/P

Carcinogenicity Indicators

NTP: N/P

IARC: N/P

OSHA: N/P

Carcinogenicity Explanation: N/P

Section 4 - First Aid Measures
COPPER NAPHTHENATE, WOOD PRESERVATIVE

First Aid:

FRESH AIR. FLUSH EYES THOROUGHLY, WASH SKIN THOROUGHLY; MEDICAL ATTENTION IF NECESSARY.

Section 5 - Fire Fighting Measures
COPPER NAPHTHENATE, WOOD PRESERVATIVE

Fire Fighting Procedures:

AS W/KEROSENE

Unusual Fire or Explosion Hazard:

N/P

Extinguishing Media:

CO*2, FOAM

Flash Point: Flash Point Text: 140F TCC

Autoignition Temperature:

Autoignition Temperature Text: N/A

Lower Limit(s): 1.0

Upper Limit(s): 6.0

Section 6 - Accidental Release Measures
COPPER NAPHTHENATE, WOOD PRESERVATIVE

Spill Release Procedures:

ABSORB

Section 7 - Handling and Storage
COPPER NAPHTHENATE, WOOD PRESERVATIVE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
COPPER NAPHTHENATE, WOOD PRESERVATIVE

Respiratory Protection:

N/P

Ventilation:

LOCAL EXHAUST: FUME HOOD. OTHER: OUTDOORS.

Protective Gloves:
RUBBER/PLASTIC
Eye Protection: GOGGLES/FACE SHIELD
Other Protective Equipment: N/P
Work Hygienic Practices: N/P
Supplemental Health & Safety Information: MFG SUGGESTS TLV OF 500 PPM

Section 9 - Physical & Chemical Properties
COPPER NAPHTHENATE, WOOD PRESERVATIVE

HCC: V4
NRC/State License Number: N/A
Net Property Weight for Ammo: N/A
Boiling Point: Boiling Point Text: 300F
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/A
Vapor Pressure: 5. Vapor Density: 5.00
Percent Volatile Organic Content:
Specific Gravity: 0.8300
Volatile Organic Content Pounds per Gallon:
pH: N/P
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: 0.08 (BUAC)
Solubility in Water: NEGLIGIBLE
Appearance and Odor: VISCOUS GREEN LIQ, MILD OILY ODOR
Percent Volatiles by Volume: 70.0
Corrosion Rate: N/P

Section 10 - Stability & Reactivity Data
COPPER NAPHTHENATE, WOOD PRESERVATIVE

Stability Indicator: YES
Materials to Avoid:
N/P
Stability Condition to Avoid:
HIGH TEMPERATURE
Hazardous Decomposition Products:
CO, CO*2
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/P

Section 11 - Toxicological Information
COPPER NAPHTHENATE, WOOD PRESERVATIVE

Toxicological Information:
N/P

Section 12 - Ecological Information
COPPER NAPHTHENATE, WOOD PRESERVATIVE

Ecological Information:
N/P

Section 13 - Disposal Considerations
COPPER NAPHTHENATE, WOOD PRESERVATIVE

Waste Disposal Methods:

ABSORB & BURY IF IN COMPLIANCE W/FED, STATE & LOCAL REGULATIONS.

Section 14 - MSDS Transport Information
COPPER NAPHTHENATE, WOOD PRESERVATIVE

Transport Information:

N/P

Section 15 - Regulatory Information
COPPER NAPHTHENATE, WOOD PRESERVATIVE

SARA Title III Information:

N/P

Federal Regulatory Information:

N/P

State Regulatory Information:

N/P

Section 16 - Other Information
COPPER NAPHTHENATE, WOOD PRESERVATIVE

Other Information:

N/P

HMIS Transportation Information

Product Identification: COPPER NAPHTHENATE, WOOD PRESERVATIVE**Transportation ID Number:** 66085**Responsible Party CAGE:** EO566**Date MSDS Prepared:** 01/01/1987**Date MSDS Reviewed:** 03/03/1981**MFN:** 03/03/1981**Submitter:** N TN**Status Code:** C**Container Information****Unit of Issue:** NK**Container Quantity:** NK**Type of Container:****Net Unit Weight:****Article without MSDS:** N**Technical Entry NOS Shipping Number:****Radioactivity:****Form:****Net Explosive Weight:****Coast Guard Ammunition Code:****Magnetism:** N/P**AF MMAC Code:****DOD Exemption Number:****Limited Quantity Indicator:****Multiple Kit Number:** 0

Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:
N/A

Department of Transportation Information

DOT Proper Shipping Name: COATING SOLUTION
DOT PSN Code: DNL
Symbols:
DOT PSN Modifier: (INCLUDES SURFACE TREATMENTS OR COATINGS USED FOR INDUSTRIAL OR OTHER PURPOSES SUCH AS VEHICLE UNDERCOATING, DRUM OR BARREL LINING)
Hazard Class: 3
UN ID Number: UN1139
DOT Packaging Group: III
Label: 3
Special Provision(s): B1,T7,T30
Packaging Exception: 150
Non Bulk Packaging: 203
Bulk Packaging: 242
Maximum Quantity in Passenger Area: 60 L
Maximum Quantity in Cargo Area: 220 L
Stow in Vessel Requirements: A
Requirements Water/Sp/Other:

IMO Detail Information

IMO Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. o
IMO PSN Code: H1A
IMO PSN Modifier:
IMDG Page Number: 3345
UN Number: 1993
UN Hazard Class: 3.3
IMO Packaging Group: III
Subsidiary Risk Label: -
EMS Number: 3-07
Medical First Aid Guide Number: T

IATA Detail Information

IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
IATA PSN Code: ZZZ
IATA PSN Modifier:
IATA UN Id Number: N/R
IATA UN Class: N/R
Subsidiary Risk Class: N/R
UN Packaging Group: N/R
IATA Label: N/R
Packaging Note for Passengers: N/R
Maximum Quantity for Passengers: N/R
Packaging Note for Cargo: N/R
Maximum Quantity for Cargo: N/R
Exceptions: N/R

AFI Detail Information

AFI Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
AFI Symbols:
AFI PSN Code: ZZZ
AFI PSN Modifier:

AFI UN Id Number: N/R
AFI Hazard Class: N/R
AFI Packing Group: N/R
AFI Label: N/R
Special Provisions: N/A
Back Pack Reference: N/A

HAZCOM Label Information

Product Identification: COPPER NAPHTHENATE, WOOD PRESERVATIVE
CAGE: EO566
Assigned Individual: Y
Company Name: BAIRD & MCGUIRE, INC.
Company PO Box: 369
Company Street Address1: UNKNOWN
Company Street Address2: UNKNOWN, NK 00000 NK
Health Emergency Telephone:
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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Material Safety Data Sheet

CREOSOTE

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: CREOSOTE
OTHER/GENERIC NAMES: Coal Tar Creosote, KMG-B Coal Tar Creosote, Creosote Oil
PRODUCT USE: Wood preservative
COMPANY: KMG-Bernuth, Inc.
10611 Harwin, Suite 402
Houston, Texas 77036
Telephone: 713-988-9252

U. S. EPA Registration Nos. 61470-1
61483-7, 61483-8
61483-9, 61483-10

IN CASE OF EMERGENCY CALL:
(24 Hours/Day, 7 Days/Week)

CHEMTREC: 1 800 424 9300

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Creosote *	8001-58-9	100

* Mixture of 2, 3, & 4-ringed polynuclear aromatic hydrocarbons, including some substituted compounds

Trace impurities and additional material names not listed above may also appear in Section 15. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Creosote is a brown to black oily liquid with a penetrating smoky odor. Vapor causes moderate to severe irritation of eyes, nose, throat and respiratory tract. Liquid can cause burning and itching with reddening of the skin, which is accentuated by sunlight.

POTENTIAL HEALTH HAZARDS

SKIN: Contact with skin can result in irritation, which when not washed off or when accentuated by sunlight, can result in minor burns.

EYES: Overexposure to product vapors can result in irritation. Eye contact with product will result in irritation, which in the absence of recommended first aid can result in effects ranging from minor burns to severe corneal injury, including keratitis, conjunctivitis and corneal abrasion.

MATERIAL SAFETY DATA SHEET

CREOSOTE

INHALATION:	Overexposure to vapor may result in irritation to respiratory tract. Prolonged exposure in significant excess of permissible air concentrations can result in acute toxic effects, such as dizziness, respiratory difficulty, convulsions and possible cardiovascular collapse.
INGESTION:	Irritation of the gastrointestinal tract followed by nausea and vomiting, abdominal discomfort, rapid pulse etc. Cardiovascular collapse may occur.
DELAYED EFFECTS:	Prolonged and repeated skin exposure over many years in the absence of recommended hygiene practices may lead to changes in skin pigmentation, benign skin growths and may, in some cases, result in skin cancer. Additionally, inhalation may present a lung cancer hazard.

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

<u>INGREDIENT NAME</u>	<u>NTB STATUS</u>	<u>IARC STATUS</u>	<u>OSHA LIST</u>
Creosote	Carcinogen	2A - Probable	-

4. FIRST AID MEASURES

SKIN:	Wash thoroughly with waterless hand cleaners, olive oil or soap and water. Avoid solvents.
EYES:	Flush eyes immediately with large amounts of water or olive oil for at least 15 minutes. Call a physician
INHALATION:	Remove to fresh air. If not breathing, give artificial respiration; preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.
INGESTION:	If conscious, first induce vomiting, then take 2 tablespoons of activated charcoal (USP-drug grade) in water. Get immediate medical attention. Do not induce vomiting, or give anything by mouth to an unconscious person.
ADVICE TO PHYSICIAN:	No additional instructions.

5. FIREFIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINTS:	> 93° C (> 200° F) / > 93° C (> 200° F)
FLASH POINT METHOD:	Closed Cup / Open Cup
AUTOIGNITION TEMPERATURE:	336° C (637° F)
UPPER FLAME LIMIT (volume 0/6 in air):	Not Determined
LOWER FLAME LIMIT (volume % in air):	Not Determined
FLAME PROPAGATION RATE (solids):	Not Applicable
OSHA FLAMMABILITY CLASS:	Not Determined

MATERIAL SAFETY DATA SHEET

CREOSOTE

EXTINGUISHING MEDIA: Water/fog, carbon dioxide, foam, dry chemicals, sand or steam.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Water/fog is recommended for the control of unconfined oil fires, but water may cause frothing or eruption in closed tank.

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS: Self-contained breathing apparatus (SCBA) and full protective clothing should be worn when fumes and/or smoke are present.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment)

Avoid breathing vapors and contact with skin and eyes. Avoid sources of ignition (sparks or open flame). Contain the spill or leak with solids, such as sand, earth, etc. Contaminated materials must be handled and managed as RCRA Hazardous Waste and treated before disposal in approved facilities. Do not allow to enter into sewers or waterways.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15.

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment)

Wear clothing closed at the neck, long sleeves and non-porous type gloves, eg. neoprene, butyl rubber, nitrile, poly-vinyl alcohol (PVA), polyvinyl chloride (PVC).

STORAGE RECOMMENDATIONS: Recommended temperature for storage is about 140° F.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Use in areas with adequate natural or local exhaust ventilation.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION: Avoid skin contact whenever possible by using non-porous type gloves. For outdoor work use a waterproof sunscreen (SPF 25 or greater); reapply every 90 minutes while in direct sun. For exposed skin, use protective creams (for example: MSA's Fend AE-2, Kerodex 51, Jergens SBS-46).

EYE PROTECTION: Safety glasses, goggles and/or face shield.

RESPIRATORY PROTECTION: Not required for properly ventilated areas. Use a NIOSH approved respirator with suitable organic vapor cartridge as necessary to control exposures above the TLV of PEL.

ADDITIONAL RECOMMENDATIONS: Do not take contaminated work clothing home. It is recommended that a complete soap and water shower and/or steam bath be taken at the end of each working day.

MATERIAL SAFETY DATA SHEET

CREOSOTE

EXPOSURE GUIDELINES

INGREDIENT NAME		ACGIH TLV	OSHA PEL	OTHER LIMIT
Creosote (measured as Coal Tar Pitch Volatiles, CTPV)		0.2 mg/m ³	0.2 mg/ m ³	-
HAZARDOUS INGREDIENTS	CAS NUMBER	% BY WT.	EXPOSURE LIMIT	(PPM; MG/M3)
Coal Tar Distillate	65996-92-1		OSHA-TWA -	*
Indene	95-13-6	<10	ACGIH-TWA 10	48
			OSHA-TWA 10	45
Naphthalene	91-20-3	<15	ACGIH-TWA 10	52
			ACGIH-STEL 15	79
			OSHA-TWA 10	50
			OSHA-STEL 15	75
			NIOSH-TWA 10	50
			NIOSH-STEL 15	75
Biphenyl	92-52-4	<5	ACGIH-TWA 0.2	1.3
			OSHA-TWA 0.2	1
Benzene	71-43-2	<1	ACGIH-TWA 10	32**, #
			OSHA-TWA 1	***
			OSHA-STEL 5	-
			NIOSH-TWA 0.1	-
			NIOSH-STEL 1	-
Alkyl naphthalene		<10	none	
Phenanthrene	85-01-8	9-13	NONE	
Benz (a) anthracene	56-55-3	1.6	NONE	
Benzo (a) phenanthrene	218 01-9	1.7	NONE	
Benzo (b) fluoranthene+	205-99-2		NONE	
Benzo (k) fluoranthene+	207-08-9		NONE	
Benzo (j) fluoranthene+	205-82-3		NONE	
7, 12-Dimethylbenz (a) anthracene	57-97-6	2.43	NONE	
Indeno (1,2,3-cd) pyrene	193-39-5	0.25	NONE	
Benzo (a) pyrene	50-32-8	0.92	NONE	
Dibenzo (a,h) anthracene	53-70-3	0.09	NONE	
Benzo (g,h,i) perylene+	191-24-2		NONE	
7-H Dibenzo (c,g) carbazole	194-59-2	0.18	NONE	
Dibenzo (a,l) pyrene	191-30-0	0.02	NONE	
1-Nitropyrene	5522-43-0	0.24	NONE	
Dibenz (a,j) acridine	224-42-0	0.06	NONE	
Dibenz (a,h) acridine	226-36-8	0.04	NONE	

-----SARA TITLE III SECTION 313 CHEMICALS-----
(SEE SECTION VII FOR CAS NUMBERS AND PERCENTAGES)

Naphthalene
Biphenyl
Benzene
Phenanthrene / Benz (a) anthracene
Benzo (a) phenanthrene
Benzo (b) fluoranthene / Benzo (k) fluoranthrene
Benzo (j) fluoranthrene
Benzo (a) pyrene
Dibenzo (a,h) anthracene
Indeno (1,2,3-cd) pyrene
1-Nitropyrene
7,12-Dimethylbenz (a) anthracene
7-H Dibenzo (c,g) carbazole / Benzo (g,h,i) perylene
Dibenzo (a,l) pyrene
Dibenz (a,j) acridine
Dibenz (a,h) acridine

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

None

MATERIAL SAFETY DATA SHEET

CREOSOTE

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Dark brown to black oily liquid
PHYSICAL STATE:	Liquid
MOLECULAR WEIGHT:	130-210
CHEMICAL FORMULA:	Mixture of organic compounds
ODOR:	Penetrating smoky odor
SPECIFIC GRAVITY (water=1.0):	1.03-1.18 (Avg.: 9.1 lbs/ gal)
SOLUBILITY IN WATER (weight %):	Insoluble
pH:	Not Determined
BOILING POINT:	194 - 400° C
MELTING POINT:	Not Determined
VAPOR PRESSURE (in mm Hg):	at 100° C - 80 mm; at 125° C - 225 mm; at 150° C - 370 mm
VAPOR DENSITY (air = 1.0):	< 1
EVAPORATION RATE:	< 1 COMPARED TO: Butyl Acetate -1
% VOLATILES:	Not Determined
FLASH POINT:	Closed cup: > 93° C (>200° F) Open cup: > 93° C (>200° F)

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

STABILITY (CONDITIONS TO AVOID): Product stable under normal conditions.

Due to its low vapor pressure and extremely low evaporation rate, the volatility rate at 20° C is almost zero. Upon heating, at extremely high temperatures, hydrocarbons will be emitted and some degradation will take place. Avoid loading or unloading near open flame.

INCOMPATIBILITIES: Mixing chlorosulfonic acid and creosote oil in a closed container can cause an increase in temperature and pressure (NFPA 491M, 1991)

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose under normal conditions of use. When heated to extreme temperatures creosote emits acrid smoke.

HAZARDOUS POLYMERIZATION: Will not occur

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS: Oral LD₅₀; 725 mg/kg (rat); 433 mg/kg (mouse)

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS: Several studies in mice have shown the formation of both local (i.e. skin) and distant (i.e. lung) tumor formation after dermal exposure to creosote. [Poel & Kammer, 1957; Roe et al, 1958]

OTHER DATA: Has caused mutations in *S. typhimurium* strains TA98, TA100, TA1537, TA1538 and mouse lymphoma cell L5178y. [Fed Reg., 1978; Bos et al, 1983] Death from large doses of creosote appears due primarily to cardiovascular collapse. Fatalities have occurred 14-36 hours after the ingestion of creosote (about 7g for adults; about 1 or 2g for children). [Clayton & Clayton, 3rd ed., 1981]

MATERIAL SAFETY DATA SHEET
CREOSOTE

12. ECOLOGICAL INFORMATION

TL₅₀, *Carassius auratus* (goldfish); 3.51 ppm/24 hours [60:40 mixture of creosote & coal tar]
TL₅₀, *Lepomis macrochirus* (bluegill); 4.42 ppm/24 hours [60:40 mixture of creosote & coal tar]
TL₅₀, *Salmo gairdner* (rainbow trout); 3.72 ppm/24 hours [60:40 mixture of creosote & coal tar]
LD₅₀, *Colinus virginianus* (bobwhite quail); 1260 ppm/8 days [60:40 mixture of creosote & coal tar]
LD₅₀, *Anas platyrhynchos* (mallard duck); 10,388 ppm/8 days [60:40 mixture of creosote & coal tar]

13. DISPOSAL CONSIDERATIONS

RCRA

Is the unused product a RCRA hazardous waste if discarded? YES

If yes, the RCRA ID number is: U051

OTHER DISPOSAL CONSIDERATIONS:

Other waste code designations for creosote containing wastes appear in the December 6, 1990 *Federal Register* as F034; Wastewater's, process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use creosote formulations. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol. Please consult with the appropriate state regulatory authorities to determine when the F034 designation is effective in the given state.

Creosote-containing waste may also be characteristic hazardous wastes, even if not meeting the U051, K001, or F034 waste code designation.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT HAZARD CLASS: Environmentally Hazardous Substance, Liquid, N.O.S. (Creosote), 9
US DOT ID NUMBER: UN 3082
US DOT SHIPPING NAME: RQ, Environmentally Hazardous Substance, Liquid, N.O.S. (Creosote), 9, UN3082, III

For additional information on shipping regulations affecting this material, contact the number found in Section 1.

MATERIAL SAFETY DATA SHEET
CREOSOTE

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

TSCA INVENTORY STATUS: Listed on EPA's TSCA Inventory

OTHER TSCA ISSUES: Substance of unknown or variable composition

SARA TITLE III/CERCLA

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

<u>INGREDIENT NAME</u>	<u>WEIGHT %</u>	<u>SARA/CERCLA RQ (LB)</u>	<u>SARA EHS TPO (LB)</u>
Creosote	100 %	1	None

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802], State Emergency Response Commission and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: Immediate, Delayed, Fire

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 2.

<u>INGREDIENT NAME</u>	<u>WEIGHT</u>	<u>COMMENT</u>
Creosote	100%	de minimus concentration is 0.1%

STATE-RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

<u>INGREDIENT NAME</u>	<u>WEIGHT</u>	<u>COMMENT</u>
None		

ADDITIONAL REGULATORY INFORMATION: For some applications, Creosote is also regulated as a "Restricted Use" pesticide under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

WHMIS CLASSIFICATION (CANADA): Class D, Division 2, Subdivision A, very toxic material

FOREIGN INVENTORY STATUS: Listed on the EINECS Inventory - ID# 2322875
Listed on Canadian Inventory Domestic Substance List (DSL)

16. OTHER INFORMATION

CURRENT ISSUE DATE: March 2003

PREVIOUS ISSUE DATE: January 2002

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

Updated DOT transportation information

Updated to include 16-section ANSI format for Material Safety Data Sheets

OTHER INFORMATION: NFPA Hazard Ratings:
 Health (Blue): 2
 Flammability (Red): 2
 Reactivity (Yellow): 0

REFERENCES:

1. ACGIH (1995): "1995-1996 Threshold Limit Values...."
2. USDOL/OSHA General Industry 29 CFR 1910.1000 Coal Tar Pitch Volatile (CTPV) Permissible Exposure Limit
3. USEPA 40 CFR Parts 112; 261; 268; 300
4. USDOT 49 CFR Part 172
5. USEPA(1986) "Evaluation of the Potential Carcinogenicity of Creosote (8001-58-9)", Prepared by the Carcinogen Assessment Group, Office of Health and Environmental Assessment, Washington, DC for the Office of Emergency and Remedial Response and the Office of Solid Waste and Emergency Response, Washington, DC
6. National Fire Prevention Association (1991): "Fire Protection Guide on Hazardous Materials", 10th ed. NFPA:Quincy, MA, pg 325M-29, 491M.
7. USEPA (1980) "Health and Environmental Effects of Creosote", EPA # 53, pg 53-12
8. Clayton & Clayton, eds (1981): "Patty's Industrial Hygiene & Toxicology, Volume 2A, 2B, 2C Toxicology", 3rd ed. John Wiley & Sons, New York, NY
9. NIOSH (1977): "Criteria for a recommended standard...Occupational Exposure to Coal Tar Products", USDHEW/NIOSH Publication # 78-107
10. Poel, W.E. and Kammer, A.G. (1957): "Experimental carcinogenicity of coal-tar fractions: The carcinogenicity of creosote oils" J NATL. CANCER INST 18(1):41-55
11. Roe, F.J.C., Bosch, D., Boutwell, R.K. (1958): "The carcinogenicity of creosote oil: The induction of lung tumors in mice" CANCER RES 18:1176-1178
12. Bos, R.P., Hulshof, C.T.J., Theuvs, J.L.G., Hendershon, P.Th. (1983): "Mutagenicity of creosote in the *Salmonella*/microsome assay" MUT RES 119:21-25
13. FEDERAL REGISTER (1978), Vol 43 #200; October 18th, page 48199
14. IARC (1987): "Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man", World Health Organization (WHO): Geneva p S7 177
15. NTP (1994): "National Toxicology Program's 7th Annual Report on Carcinogens 1994 - Summary"

MATERIAL SAFETY DATA SHEET
WOLMANIZED® NATURAL SELECT™ TREATED WOOD AND LUMBER
January 1, 2004

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: Wolmanized® Natural Select™ Treated Wood And Lumber
General Use: Treated Wood Products

MANUFACTURER:

TELEPHONE NUMBERS:

2. COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS	PERCENT	CAS #	EXPOSURE LIMITS (mg/m ³)		
			OSHA-PEL	ACGIH-TLV	ACGIH-STEL
Basic Copper Carbonate	<2	12069-69-1	1.0 (as Cu)	1.0 (as Cu)	
Tebuconazole	<1	107534-96-3			
Wood Dust*			15.0 (softwood)	5.0 (softwood)	
Formaldehyde**		50-00-0	1ppm		2ppm STEL
Ammonia	<1	7664-41-7	35 (50 ppm)	25 ppm	35 ppm

*A state-run OSHA program may have more stringent limits for wood dust and/or PNOR. Please contact your state for further details.

**Only applies to Plywood Products

3. HAZARDS IDENTIFICATION

Inhalation: Airborne treated or untreated wood dust may cause nose, throat or lung irritation. Various species of untreated wood dust can elicit allergic respiratory response in sensitized persons.

Eye Contact: Treated or untreated wood dust may cause mechanical irritation.

Skin Contact: Handling wood may result in skin exposure to splinters. Prolonged and/or repeated contact with treated or untreated wood dust may result in mild irritation. Various species of untreated wood dust can elicit allergic type skin irritation in sensitized persons.

Ingestion: Not anticipated to occur.

Chronic Wood Dust (treated or untreated) Effects: Wood dust, depending on species, may cause dermatitis on prolonged, repetitive contact; may cause respiratory sensitization and/or irritation.

4. FIRST AID MEASURES

Inhalation: Remove from wood dust exposure. If breathing has stopped administer artificial respiration. Seek medical aid if symptoms persist.

Eye Contact: Gently flush any particles from the eyes with large amounts of water for at least 15 minutes. DO NOT RUB THE EYES. Seek medical aid if irritation persists.

Skin Contact: Rinse wood dust off with water. DO NOT RUB. Once the skin is free of the wood dust, wash thoroughly with soap and water. Seek medical aid if severe irritation develops.

Ingestion: Rinse the victim's mouth out with water. Do not induce vomiting. If symptoms develop, call a physician or poison center at (800) 837-0496 (Outside the US call 1-404-616-9000).

5. FIRE FIGHTING MEASURES

Flash Point NA
Auto-ignition NA

Lower Explosive Limit NA
Upper Explosive Limit NA

Extinguishing Agents: Not applicable

5. FIRE FIGHTING MEASURES CONT'D

Fire-Fighting Procedures Fire from a separate fuel source may be intense enough to cause thermal decomposition releasing toxic fumes and/or gases. Wear complete fire service protective equipment, including full-face NIOSH and NFPA – approved self-containing breathing apparatus.

Fire and Explosion Hazard: High airborne levels of wood dust may burn rapidly in the air when exposed to an ignition source.

NOTE: Although ammonia does not meet the definition of a flammable, concentrated vapors in air between 15 and 28% may be flammable if ignited by an outside ignition source.

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures: Not applicable.

Waste Disposal: See Section 13.

7. HANDLING AND STORAGE

Storage Conditions: Protect from physical damage. Maintain good housekeeping.

Caution: DO NOT BURN TREATED WOOD. Do not use pressure treated chips or sawdust as mulch. Whenever possible, sawing or machining treated or untreated wood should be performed outdoors to avoid accumulations of airborne wood dust. Wash hands thoroughly before eating, drinking, using tobacco products, and/or using restrooms.

NOTE: For plywood products only, provide adequate ventilation to reduce the possible buildup of formaldehyde vapors.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Respiratory Protection: None normally required. When sawing or cutting treated or untreated wood, wear a NIOSH approved N95 or better dust mask. If ammonia odor is above OSHA PEL levels, then a respirator with ammonia cartridges and a pre-filter will be required.

Eye Protection: Wear safety glasses with side shields or safety goggles when sawing or cutting.

Skin/Foot Protection: Leather or comparable gloves to prevent splinters. Long sleeve shirt, pants and steel toed shoes when handling treated or untreated wood.

Ventilation: Saw, cut or machine wood outdoors or in well ventilated areas. Ventilation should be sufficient to maintain inhalation exposures below OSHA PEL for particulates.

Other Protective Equipment: Wear ear plugs or muffs when using power tools.

NOTE: For plywood products only, if Formaldehyde vapor level exceeds OSHA PEL or STEL, then a NIOSH approved respirator is required.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Natural	Specific Gravity (Water =1)	NA
Odor	None to Slight Ammonia	Boiling Point	NA
Solubility in Water	NA	Vapor Density (Air=1)	NA
Physical State	Solid	Vapor Pressure	NA
pH	NA	Freezing Point	NA

10. STABILITY AND REACTIVITY

Conditions contributing to instability: None known.

Incompatibilities: Strong acids, open flame and oxidizers.

Hazardous Reactions/Decomposition/Combustion Products: Combustion products may include smoke, toxic fumes or gases.

Hazardous Polymerization: Does not occur.

11. TOXICOLOGICAL INFORMATION

Carcinogenicity Data: IARC has classified untreated hardwood and hardwood/softwood mix wood dust as a Group I human carcinogen. The wood dust classification is based primarily on IARC's evaluation of increased risk in the occurrence of adenocarcinomas of the nasal cavities and paranasal sinuses associated with occupational exposures to untreated wood dust. NTP has classified all untreated wood dust as a carcinogen.

12. ECOLOGICAL INFORMATION

No data available.

13. DISPOSAL CONSIDERATIONS

Disposal Guidance: DO NOT BURN TREATED WOOD. Do not use pressure treated chips or sawdust as mulch. Dispose of in accordance with local, state and federal regulations. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This product is typically not considered a hazardous waste but State run waste programs may be more stringent. Check with your local or state regulators prior to disposal.

14. TRANSPORT INFORMATION

DOT Hazardous Material Classification: This material is not regulated as a hazardous material by the DOT.

15. REGULATORY INFORMATION

OSHA (29 CFR 1910.1200): This product is regulated under the Hazard Communication Standard.

RCRA (40 CFR 261): DO NOT BURN TREATED WOOD. Do not use pressure treated chips or sawdust as mulch. Dispose of in accordance with local, state and federal regulations. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This product is typically not considered a hazardous waste but State run waste programs may be more stringent. Check with your local or state regulators prior to disposal.

California Proposition 65: No

ABBREVIATIONS

OSHA	Occupational Safety and Health Administration
NFPA	National Fire Protection Association
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
SARA	Superfund Authorization and Reauthorization Act
PEL	Permissible Exposure Limit
DOT	Department of Transportation
NTP	National Toxicology Program
CFR	Code of Federal Regulations
CWA	Clean Water Act
CAS	Chemical Abstracts Service

TLV	Threshold Limit Value
STEL	Short-Term Exposure Limit
RCRA	Resource Conservation and Recovery Act
ACGIH	American Conference of Governmental Industrial Hygienists
NIOSH	National Institute of Occupational Safety and Health
TSCA	Toxic Substances Control Act
IARC	International Agency for Research on Cancer
IBC	International Building Code
mg/m3	Milligrams per cubic meter
CAA	Clean Air Act

NOTICE: While the information and recommendations set forth herein are believed to be accurate as of the date hereof this company makes no guarantee or warranty, expressed or implied, as to the accuracy, reliability, or completeness of the information.

Consumer Safety Information Sheet

Copper Azole Treated Wood

USE | HANDLING | INSTALLATION AND MAINTENANCE | DISPOSAL

The primary active ingredient in copper azole is copper, which has long been established as an effective biocide in timber preservation. Tebuconazole acts as the co-biocide in the copper azole preservative, providing additional protection from fungi that copper alone would not control. Tebuconazole is commonly used for protection from fungi on food crops.

Copper azole preservative penetrates into and remains in pressure-treated wood for a long time. However, some preservative may migrate from the preserved wood into surrounding soil over time and there may be incidental contact with skin during construction or use.

Follow the safe practices listed below when working with pressure-treated wood. Specific work practices may vary depending on the environment and safety requirements of individual jobs.

Use

Wood pressure-treated with copper azole preservatives may be used inside residences as long as all sawdust and construction debris are cleaned up and disposed of after construction.

Do not use treated wood under circumstances where the preservative may become a component of food or animal feed. Examples of such sites would be structures or containers for storing silage or food.

Do not use treated wood for cutting boards or countertops.

Only use treated wood that's visibly clean and free from surface residue for patios, decks and walkways.

Do not use treated wood for construction of those portions of beehives that may come in contact with honey.

Do not use treated wood where it may come in direct or indirect contact with public drinking water, except for uses involving incidental contact such as docks and bridges.

Do not use treated wood for mulch.

Handling

Wear gloves to protect against splinters.

Wear a dust mask when machining any wood to reduce the inhalation of wood dusts. Avoid frequent or prolonged inhalation of sawdust. Machining operations should be performed outdoors whenever possible to avoid indoor accumulations of airborne sawdust.

Wear appropriate eye protection to reduce the potential for eye injury from wood particles and flying debris during machining.

Wash exposed areas thoroughly with mild soap and water after working with treated wood.

If preservative or sawdust accumulates on clothes, launder before reuse. Wash work clothes separately.

MATERIAL SAFETY DATA SHEET

PART I

What is the material and what do I need to know in an emergency?

1. PRODUCT IDENTIFICATION

TRADE NAMES (AS LABELED):

CCA TYPE C PRESSURE-TREATED WOOD

PRODUCT CLASS:

NA

SYNONYMS:

Pressure treated wood with Chromated Copper Arsenate

MANUFACTURER'S NAME:

ADDRESS:

EMERGENCY PHONE:

BUSINESS PHONE:

MSDS PREPARATION DATE:

OCTOBER 12, 2001

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			OTHER
			TLV mg/m ³	STEL mg/m ³	PEL mg/m ³	STEL mg/m ³	IDLH mg/m ³	
ARSENIC (as As ₂ O ₃)	7778-39-4	0.15-3.0	0.5	NE	0.05	NE	NE	human carc. LD ₅₀ 48 mg/kg (oral rat)
HEXAVALENT CHROMIUM (as CrO ₃)	7440-47-3	0.25-4.0	0.1 (as Cr(VI))	NE	0.1C (as CrO ₃)	NE	NE	suspect human carc. LD ₅₀ (oral- rats) 80 mg/kg
COPPER (as CuO)	1317-38-0	0.10-2.0	1.0 (8-hour TWA)	NE	1.0	NE	NE	LD ₅₀ 470 mg/kg (oral rat)
WOOD/WOOD DUST	NA	91-99.5	5.0	10.0	5.0	NE	NE	NE

NE = not established

3. HAZARD IDENTIFICATION

SYMPTOMS OF OVER EXPOSURE BY ROUTE OF EXPOSURE:

INHALATION: Wood dust may be irritating to nose and throat. Can cause chest pains and chemical pneumonitis.

CONTACT WITH SKIN or EYES: Skin lesions commonly observed on hands at base of nails and on knuckles; these are usually not disabling. Conjunctivitis (of eyes) can result from mild exposure to wood dust.

SKIN ABSORPTION: Skin absorption is possible through wood splinters, causing skin ulcers.

INGESTION: Wood fibers may result in nausea, vomiting, abdominal pain and diarrhea.

INJECTION: Direct injection of this substance may cause effects similar to skin contact and skin adsorption, including lesions and ulceration.

HEALTH EFFECTS OR RISKS FROM EXPOSURE An explanation in lay terms:

ACUTE: Toxic if ingested, inhaled, or otherwise introduced directly into the body. Ingestion of large amount could be fatal. Symptoms of acute exposure include nausea, diarrhea, and severe abdominal distress.

CHRONIC: Chronic exposure could lead to dermatitis of the skin (red, irritated, cracked, and/or painful skin), allergic skin responses can occur in sensitive people. Chronic exposure to any wood dust could result in reduction of the sense of smell.

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

If wood fibers are in the eyes, open victim's eyes while under gentle running water. Use sufficient force to open eye lids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek immediate medical attention especially if splintering occurs in the eye. If victim is not breathing, remove to fresh air and use artificial respiration to support vital functions.

If CCA pressure-treated wood is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, DO NOT induce vomiting. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or who cannot swallow.

Victim of chemical exposure and all rescuers must be taken for medical attention. Take copy of label and MSDS to physician or health professional with victim.

5. FIRE-FIGHTING MEASURES

FLASH POINT, °F (method): N/A AUTOIGNITION TEMPERATURE, °F: 520 °F

FLAMMABLE LIMITS in air by volume, %: lower N/A upper N/A

FIRE EXTINGUISHING MATERIALS: Product will burn or contribute to intensity of a fire. Fire fighting should be aimed at surrounding materials.

Water Spray: OK
Dry Chemical: OK

Carbon Dioxide: OK Foam: OK
Halon: OK

SPECIAL FIRE FIGHTING PROCEDURES: INCIPIENT FIRE RESPONDERS SHOULD WEAR EYE PROTECTION AND SELF BREATHING APPARATUS. STRUCTURAL FIRE FIGHTERS MUST WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE EQUIPMENT. TOXIC VAPORS MAY BE GIVEN OFF FROM BURNING WOOD.

UNUSUAL FIRE & EXPLOSION HAZARDS: WHEN HEATED TO DECOMPOSITION, THIS PRODUCT MAY EMIT TOXIC FUMES CONTAINING ARSENIC, COPPER, AND/OR CHROMIUM. HIGH AIRBORNE LEVELS OF WOOD DUST MAY BURN RAPIDLY IN THE AIR WHEN EXPOSED TO AN IGNITION SOURCE. ASH FROM FIRE MAY CONTAIN TOXIC COMPOUNDS.

6. ACCIDENTAL RELEASE MEASURES

SPILL & LEAK RESPONSE: CCA pressure-treated wood is not reportable as a leachable substance. CCA is stable in the wood cells to minimize leaching. Unused wood should be disposed of in accordance with Federal, State, and local hazardous waste disposal regulations.

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES & HYGIENE PRACTICES: Avoid getting CCA pressure-treated wood in you. Wash hands after handling CCA pressure treated wood. Do not eat or drink while handling treated wood. Follow SPECIFIC USE INSTRUCTIONS supplied with product.

STORAGE & HANDLING PRACTICES: Avoid frequent or prolonged inhalation of sawdust from treated wood. When sawing or machining treated wood, wear a dust mask that is appropriate for the task and MSHA/NIOSH approved. Whenever possible, these operations should be preformed outdoors to avoid indoor accumulations of airborne sawdust from treated wood.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION & ENGINEERING CONTROLS: Use with adequate ventilation. Use a mechanical fan or vent area to outside. Whenever possible, these operations should be performed outdoors.

RESPIRATORY PROTECTION: Industrial hygiene monitoring should be performed to verify actual exposure levels when working with treated wood where dust is created. Areas where wood dust exist, wear an MSHA/NIOSH approved dust mask. Be sure to review the consumer information sheet.

In exceptional circumstances if the level of inorganic arsenic is unknown or exceeds 20 mg/m³ or if chromium exceeds 12.5 mg/m³, a full facepiece, self-contained breathing apparatus operated in the positive pressure mode must be used. If the arsenic concentration is known, follow the respiratory protection guide provided in 29 CFR 1910.1018, the OSHA Inorganic Arsenic Standard.

EYE PROTECTION: Splash goggles or safety glasses should be used during cutting process of any wood products.

HAND PROTECTION: Use appropriate gloves for the task. Under normal conditions, wear leather or fabric gloves when handling pressure treated wood. However, vinyl, polyvinyl chloride, neoprene, BUNA-N, natural rubber, and polyethylene are generally acceptable for the safe handling of freshly treated wood at the treatment plant. Always check gloves for leaks and signs of deterioration. Wash hands after removing gloves.

BODY PROTECTION: Use body protection appropriate for the task. Normal work clothing and safety footwear is acceptable. However, chemical protective clothing made from vinyl, polyvinyl chloride, neoprene, BUNA-N, natural rubber, and polyethylene are generally acceptable for use at the wood treatment plant.

9. PHYSICAL and CHEMICAL PROPERTIES

<u>VAPOR DENSITY:</u>	N/A	<u>EVAPORATION RATE (water=1):</u>	N/A
<u>SPECIFIC GRAVITY:</u>	N/A	<u>MELTING POINT or RANGE: °C</u>	N/A
<u>SOLUBILITY IN WATER:</u>	Highly insoluble	<u>BOILING POINT:</u>	NA
<u>VAPOR PRESSURE, mm Hg @ 20 °C:</u>	N/A		
<u>APPEARANCE & COLOR:</u>	Light to dark green in color. No odor is apparent.		

HOW TO DETECT THIS SUBSTANCE (warning properties): This product has no unusual warning properties.

10. STABILITY and REACTIVITY

STABILITY: Stable

CONDITIONS TO AVOID: OPEN FLAMES WILL CAUSE PRODUCT TO DECOMPOSE, POSSIBLY PRODUCING TOXIC GASES. CONDITIONS WHICH CAN GENERATE HAZARDOUS CONDITIONS MAY OCCUR IN THE ASH CONTENT AS A RESULT OF OPEN BURNING OF CCA PRESSURE-TREATED WOOD.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: None Known.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

CONDITIONS TO AVOID: OPEN FLAMES!

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

SUSPECTED CANCER AGENT

This product's ingredient's are found on the following lists:

	<u>FEDERAL</u>	<u>OSHA</u>	<u>Z LIST</u>	<u>NTP</u>	<u>IARC</u>	<u>CAL/OSHA</u>
ARSENIC	Y				Y	Y
CHROMIUM	N				Y	N
COPPER	N				N	N

IARC, NTP and OSHA do not consistently distinguish among arsenic and chromium species, but list inorganic arsenic and chromium as human carcinogens. The International Agency for Research on Cancer(IARC) has determined there is sufficient evidence in humans for the carcinogenicity of wood dust group 1.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Inhalation exposure may aggravate pre-existing respiratory ailments. Skin contact may aggravate pre-existing dermatitis. Arsenic compounds can cause gastrointestinal and skin systemic effects upon ingestion. Arsenic compounds are acutely toxic by a subcutaneous route of exposure, such as through breaks in the skin.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms. Treat victims for arsenic pentoxide (As_2O_5) and/or chromium trioxide (CrO_3) exposure.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: Arsenic, copper, and chromium are stable in the environment. They do not decompose with time. Wood dust from cutting, processing, and sanding may contain arsenic, chromium or copper.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: Concentrations of heavy metals are known to be detrimental to plants or animals. Heavy metals are known to bio-concentrate in the food chain. No direct effect of CCA pressure treated wood on plant or vegetables has been submitted as harmful evidence to human consumption.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence has proven pressure-treated wood detrimental to marine life.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by the handling, may be disposed of by means of a sanitary landfill facility or as advised by your local hazardous waste regulatory authority.

EPA WASTE NUMBER: NA

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS NON-HAZARDOUS NON-REGULATED AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION

PROPER SHIPPING NAME:	NA
HAZARD CLASS NUMBER, DESCRIPTION:	NA
UN IDENTIFICATION NUMBER:	NA
DOT LABEL(S) REQUIRED:	NA
PACKING GROUP:	NA
EMERGENCY RESPONSE GUIDE NUMBER:	NA

15. REGULATORY INFORMATION

SARA REPORTING REQUIREMENTS: THIS PRODUCT IS NOT SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT.

TSCA INVENTORY STATUS: The chemicals in this compound ARE NOT listed on the TSCA Inventory.

CALIFORNIA PROPOSITION 65: WARNING: This wood contains chemicals known to the State of California to cause cancer. Therefore all wood products shipped into California must carry the proper carcinogenicity warnings on labels and end-tags.

CERCLA REPORTABLE QUANTITIES (RQ): CCA pressure-treated wood is not reportable under CERCLA standards.

STATE REGULATORY INFORMATION: The following chemicals in this product are covered under specific state regulations:

- Alaska - Designated Toxic and Hazardous Substances: YES
- California - Permissible Exposure Limits for Chemical Contaminants: YES
- Florida - Substance List: YES
- Illinois - Toxic Substance List: YES
- Kansas - Section 302/313 List: YES
- Massachusetts - Substance List: YES
- Minnesota - List of Hazardous Substances: YES
- Missouri - Employer Information/Toxic Substance List: YES
- New Jersey - Right to Know Hazardous Substance List: YES
- North Dakota - List of Hazardous Chemicals and Reportable Quantities: YES
- Pennsylvania - Hazardous Substance List: YES
- Rhode Island - Hazardous Substance List: YES
- Texas - Hazardous Substance List: YES
- West Virginia - Hazardous Substance List: YES
- Wisconsin - Toxic and Hazardous Substances: YES

LABELING (Precautionary Statements):

Handle in a well ventilated area.

16. OTHER INFORMATION

PREPARED BY:

CHEMICAL SPECIALTIES, INC.
ONE WOODLAWN GREEN
CHARLOTTE, N.C. 28217

Information contained in this MSDS refers only to the specific material designated and does not relate to any process or to use with any other materials. This information is furnished free of charge and is based on data believed to be reliable as of the date hereof. It is intended for use by persons possessing technical knowledge at their own discretion and risk. Since actual use is beyond our control, no guarantee, expressed or implied, and no liability is assumed by CSI in conjunction with the use of this information. Nothing herein is to be construed as a recommendation to infringe any patents.

Consumer Safety Information Sheet on CCA Preserved Wood

This wood has been preserved by pressure treatment with Chromated Copper Arsenate (CCA). CCA contains inorganic arsenic, chromium and copper and is a pesticide registered for use in Canada under the Pest Control Products Act. Treatment with CCA extends the life of wood, thus reducing demand on forest resources. Exposure to arsenic and chromium may present certain hazards. Below are steps you can take to reduce significantly releases to the environment and human exposure to these chemicals.

NEVER BURN TREATED WOOD. Arsenic and chromium may be released into the environment as part of the smoke or remain in the ashes.

Use

Wood treated with CCA should be used only when such protection is important, as in areas where the wood is subject to decay or insect attack or is in contact with damp soil or water. Treated wood is not a substitute for good building design. Proper design and construction principles must be followed to ensure long service and prevent decay. CCA-treated wood should be used in the interior of constructions only when there is a risk of accidental wetting and replacement is difficult (for example, in foundations, basements, ground-floor joists and sub-floors).

Do not use CCA-treated wood where:

- direct food contact is possible (for example, cutting boards, counter tops, beehives);
- the chemicals in the preservative may enter the food chain (for example, animal feed storage, silos, water troughs, compost bins, mulch); or
- the chemicals in the preservative may come into contact with public drinking water (for example, well or reservoir covers), except for uses involving incidental contact such as docks and bridges.

Safe Handling

- Only purchase CCA-treated wood that is visibly clean and free of surface residues, as these may contain dislodgeable toxic chemicals.
- Wear gloves and long sleeves when handling treated wood.
- Wear dust mask, eye protection, gloves and long sleeves when sawing, sanding, shaping or otherwise machining treated wood to avoid skin contact with or inhalation of sawdust.
- Where possible, cut or otherwise work with treated wood out-of-doors.
- Wash hands after working with the wood, and before eating, drinking, or smoking.
- Launder clothing before reuse. Wash separately from other clothing.

- After construction, all cut ends, sawdust and construction debris should be cleaned up and disposed of in accordance with local regulations.

Installation and Maintenance

- If wood is cut during construction, apply an appropriate "end-cut" preservative (e.g., copper naphthenate for above or below ground or zinc naphthenate for above ground only) to protect exposed, untreated wood. Use these products according to the manufacturers instructions.
- The service life of CCA-treated wood may be extended by regular application of coating or sealer which can protect the wood from weathering effects. Such maintenance may also reduce the potential release of toxic chemicals from the wood.
- The use of bleaches, deck cleaners or brighteners that contain sodium hypochlorite, sodium hydroxide, sodium percarbonate, oxalic acid, or citric acid is not recommended as they may release toxic chemicals from CCA-treated wood.
- Use corrosion-resistant fasteners to minimize damage and discoloration caused by moisture.

Reuse and Disposal

- Reuse treated wood to the extent possible.
- Do not dispose of CCA-treated wood remnants or sawdust in compost heaps, wood chips, or mulch as chemicals from the preservative may enter the food chain
- Dispose of construction wastes or material removed from service in accordance with local regulations. Contact your municipality or provincial government to find out how to dispose of CCA-treated wood in your area. (Most areas use ordinary trash collection or burial.)

NEVER BURN TREATED WOOD. Arsenic and chromium may be released into the environment as part of the smoke or remain in the ashes.

This information sheet is reviewed annually. Revised: October 2001
Environment Canada Strategic Options Process Treater/Manufacturers Steering Committee

HOME

(HOME | FRANÇAIS)

Tim-bor® Industrial

Material Safety Data Sheet

DATE OF ISSUE August 2003

Supersedes May 2000 Version

1 Chemical product and company identification

Product name: *Tim-bor* Industrial
 Grade: Technical
 Product use: Wood preservative
 Chemical formula: $\text{Na}_2\text{B}_4\text{O}_{13} \cdot 4\text{H}_2\text{O}$
 Chemical name/synonyms: Disodium octaborate tetrahydrate, *Tim-bor* DPT®
 Chemical family: Inorganic borates
 CAS registry number: 12280-03-4
 EPA / PCP Reg. No.: 1624-39/ 18879
 (Refer to Section 15 for TSCA/DSL Chemical inventory listing)

MANUFACTURER:

U.S. Borax Inc.
 26877 Tourney Road
 Valencia, CA 91355-1847

EMERGENCY PHONE NUMBERS:

24 Hr. Medical Info. Service ... (661) 284-5200
 Chemtrec (Spills): ... (800) 424-9300

2 Composition/information on ingredients

This product contains greater than 98 percent (%) disodium octaborate tetrahydrate, $\text{Na}_2\text{B}_4\text{O}_{13} \cdot 4\text{H}_2\text{O}$, which is hazardous under the OSHA Hazard Communication Standard and under

the Canadian Controlled Products Regulations of the Hazardous Products Act (WHMIS), based on animal chronic toxicity studies. Refer to Sections 3 and 11 for details on hazards.

3 Hazard identification

Emergency overview

Tim-bor Industrial is a white, odorless, powder substance that is not flammable, combustible, or explosive and has low acute oral and dermal toxicity.

Potential ecological effects

Large amounts of *Tim-bor* Industrial can be harmful to plants and other species. Therefore, releases to the environment should be minimized.

Potential health effects

Routes of exposure: Inhalation is the most significant route of exposure in occupational and other settings. Dermal exposure is not usually a concern because *Tim-bor* Industrial is poorly absorbed through intact skin.

Inhalation: Occasional mild irritation effects to the nose and throat may occur from inhalation of *Tim-bor* Industrial dust at levels greater than 10 mg/m³.

Eye contact: *Tim-bor* Industrial is non-irritating to the eyes in normal industrial use.

Skin contact: *Tim-bor* Industrial does not cause irritation to intact skin.

Ingestion: Products containing *Tim-bor* Industrial are not intended for ingestion. *Tim-bor* Industrial has a low acute toxicity. Small amounts (e.g., a teaspoon) swallowed accidentally are not likely to cause effects; swallowing amounts larger than that may cause gastrointestinal symptoms.

Cancer: *Tim-bor* Industrial is not a known carcinogen.

Reproductive/developmental: Animal ingestion studies in several species, at high doses, indicate that borates cause reproductive and developmental effects. A human study of occupational exposure to borate dust showed no adverse effect on reproduction.

Target organs: No target organ has been identified in humans. High dose animal ingestion studies indicate the testes are the target organs in male animals.

Signs and symptoms of exposure: Symptoms of accidental over-exposure to *Tim-bor* Industrial might include nausea, vomiting and diarrhea, with delayed effects of skin redness and peeling. These symptoms have been associated with the accidental over-exposure to the chemically related substance boric acid.

Refer to Section 11 for details on toxicological data.

4 First aid measures

Inhalation: If symptoms such as nose or throat irritation are observed, remove person to fresh air.

Eye contact: Use eye wash fountain or fresh water to cleanse the eye. If irritation persists for more than 30 minutes, seek medical attention.

Skin contact: No treatment necessary because non-irritating.

Ingestion: Swallowing small quantities (one teaspoon) will cause no harm to healthy adults. If larger amounts are swallowed, give two glasses of water to drink and seek medical attention.

Note to physicians: Observation only is required for adult ingestion in the range of 4-8 grams of *Tim-bor* Industrial. For ingestion of larger amounts, maintain adequate kidney function and force fluids. Gastric lavage is recommended for symptomatic patients only. Hemodialysis should be reserved for massive acute ingestion or patients with renal failure. Boron analyses of urine or blood are only useful for documenting exposure and should not be used to evaluate severity of poisoning or to guide treatment¹. Refer to Section 11 for details.

5 Firefighting measures

General hazard: None, because *Tim-bor* Industrial is not flammable, combustible or explosive. The product is itself a flame retardant.

Extinguishing media: Any fire extinguishing media may be used on nearby fires.

Flammability classification (29 CFR 1910.1200): Non-flammable solid.

6 Accidental release measures

General: *Tim-bor* Industrial is a water-soluble white powder that may, at high concentrations, cause damage to trees or vegetation by root absorption. (Refer to Ecological information, Section 12, for specific information.)

Land spill: Vacuum, shovel or sweep up *Tim-bor* Industrial and place in containers for disposal in accordance with applicable local regulations. Avoid contamination of water bodies during cleanup and disposal.

Spillage into water: Where possible, remove any intact containers from the water. Advise local water authority that none of the affected water should be used for irrigation or for the abstraction of potable water until natural dilution returns the boron value to its normal environmental background level. (Refer to Sections 12, 13 and 15 for additional information.) *Tim-bor* Industrial is a non-hazardous waste when spilled or disposed of, as defined in the Resource Conservation and Recovery Act (RCRA) regulations (40 CFR 261). (Refer to Regulatory information, Section 15, for additional references.)

7 Handling and storage

General: No special handling precautions are required, but dry, indoor storage is recommended. To maintain package integrity and to minimize caking of the product, bags should be handled on a first-in, first-out basis. Good housekeeping procedures should be followed to minimize dust generation and accumulation.

Storage temperature: Ambient

Storage pressure: Atmospheric

Special sensitivity: Moisture (caking)

8 Exposure controls/personal protection

Engineering controls: Use local exhaust ventilation to keep airborne concentrations of *Tim-bor* Industrial dust below permissible exposure levels.

Personal protection: Refer to label for actual regulatory personal protection requirements. Where airborne concentrations are expected to exceed exposure limits (e.g. confined spaces), NIOSH/MSHA certified respirators must be used. Eye protection, protective clothing and waterproof gloves may also be warranted under certain high exposure conditions.

Occupational exposure limits: Disodium octaborate tetrahydrate (*Tim-bor* Industrial) is treated by OSHA, Cal OSHA and ACGIH as "Particulate Not Otherwise Classified" or "Nuisance Dust".

ACGIH/TLV:	10 mg/m ³
Cal OSHA/PEL:	10 mg/m ³
OSHA/PEL (total dust):	15 mg/m ³
OSHA/PEL (respirable dust):	5 mg/m ³

9 Physical and chemical properties

Appearance:	White, odorless, powder
Bulk density:	320 to 480 kg/m ³
Vapor pressure:	Negligible @ 20°C
Solubility in water:	9.7% @ 20°C; 34.3% @ 50°C

Melting point:	815°C
pH @ 20°C:	8.3 (3.0% solution) 7.6 (10.0% solution)
Molecular weight:	412.52

10 Stability and reactivity

General: *Tim-bor* Industrial is a stable product.

Incompatible materials and conditions to avoid: Reaction with strong reducing agents, such as metal hydrides or alkali metals, will generate hydrogen gas, which could create an explosive hazard.

Hazardous decomposition: None.

11 Toxicological information

Acute toxicity

Ingestion: Low acute oral toxicity; LD₅₀ in rats is 2,550 mg/kg of body weight.

Skin/dermal: Low acute dermal toxicity; LD₅₀ in rabbits is greater than 2,000 mg/kg of body weight. *Tim-bor Industrial* is poorly absorbed through intact skin.

Inhalation: Low acute inhalation toxicity; LC₅₀ in rats is greater than 2.0 mg/L (or g/m³).

Skin irritation: Non-irritant.

Eye irritation: Draize test in rabbits produced mild eye irritation effects. Years of occupational exposure to *Tim-bor Industrial* indicates no adverse effects on human eye. Therefore *Tim-bor Industrial* is not considered to be a human eye irritant in normal industrial use.

Sensitization: *Tim-bor Industrial* is not a skin sensitizer.

Other

Reproductive/developmental toxicity: Animal feeding studies in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes². Studies with the chemically related boric acid in the rat, mouse and rabbit, at high doses, demonstrate developmental effects on the fetus, including fetal weight loss and minor skeletal variations^{3, 4}. The doses administered were many times in excess of those to which humans would normally be exposed⁵.

Carcinogenicity/mutagenicity: No evidence of carcinogenicity in mice⁶. No mutagenic activity was observed for boric acid in a battery of short-term mutagenicity assays.

Human data: Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to boric acid dust and sodium borate dust. A recent epidemiology study under the conditions of normal occupational exposure to borate dusts indicated no effect on fertility⁷.

12 Ecological information

Ecotoxicity data

General: Boron (B) is the element in disodium octaborate tetrahydrate (*Tim-bor Industrial*) which is used by convention to report borate product ecological effects. It occurs naturally in seawater at an average concentration of 5 mg B/L and generally occurs in freshwater at concentrations up to 1 mg B/L. In dilute aqueous solutions the predominant boron species present is undissociated boric acid. To convert disodium octaborate tetrahydrate into the equivalent boron (B) content, multiply by 0.2096.

Phytotoxicity: Boron is an essential micronutrient for healthy growth of plants; however, it can be harmful to boron sensitive plants in high quantities. Care should be taken to minimize the amount of *Tim-bor Industrial* released to the environment.

Algal toxicity:

Green algae, *Scenedesmus subspicatus*
96-hr EC₁₀ = 24 mg B/L[†]

Invertebrate toxicity⁸:

Daphnids, *Daphnia magna straus*
24-hr EC₅₀ = 242 mg B/L[†]

Test substance: [†] sodium tetraborate

Fish toxicity:

Seawater⁹:

Dab, *Limanda limanda*

96-hr LC₅₀ = 74 mg B/L[†]

Freshwater¹⁰:

Rainbow trout, *S. gairdneri* (embryo-larval stage)

24-day LC₅₀ = 88 mg B/L[†]

32-day LC₅₀ = 54 mg B/L[†]

Goldfish, *Carassius auratus* (embryo-larval stage)

7-day LC₅₀ = 65 mg B/L[†]

3-day LC₅₀ = 71 mg B/L[†]

Environmental fate data

Persistence/degradation: Boron is naturally occurring and ubiquitous in the environment. *Tim-bor Industrial* decomposes in the environment to natural borate.

Octanol/water partition coefficient: No value. In aqueous solution disodium octaborate tetrahydrate is converted substantially into undissociated boric acid.

Soil mobility: *Tim-bor Industrial* is soluble in water and is leachable through normal soil.

13 Disposal considerations

Disposal guidance: Small quantities of *Tim-bor Industrial* can usually be disposed of at landfill sites. No special disposal treatment is required, but local authorities should be consulted about any specific local requirements. Tonnage quantities of product should, if possible, be used for an appropriate application.

RCRA (40 CFR 261): *Tim-bor Industrial* is not listed under any sections of the Federal Resource Conservation and Recovery Act (RCRA).

NPRI (Canada): *Tim-bor Industrial* is not listed on the Canadian National Pollutant Release Inventory.

Refer to Section 15 for additional regulatory information.

14 Transport information

DOT hazardous classification: Disodium octaborate tetrahydrate (*Tim-bor Industrial*) is not regulated by the U.S. Department of Transportation (DOT) and is therefore not considered a hazardous material/substance.

TDG Canadian transportation: Disodium octaborate tetrahydrate (*Tim-bor Industrial*) is not regulated under Transportation of Dangerous Goods (TDG).

International transportation: Disodium octaborate tetrahydrate (*Tim-bor Industrial*) has no UN Number, and is not regulated under international rail, road, water or air transport regulations.

15 Regulatory information

OSHA/Cal OSHA: This MSDS document meets the requirements of both OSHA (29 CFR 1910.1200) and Cal OSHA (Title 8 CCR 5194 (g)) hazard communication standards. Refer to Section 8 for regulatory exposure limits.

WHMIS classification: Disodium octaborate tetrahydrate (*Tim-bor Industrial*) is classified as Class D- Division 2A under Canadian WHMIS guidelines.

FIFRA: *Tim-bor Industrial* is registered with the EPA (EPA Reg. No. 1624-39), in accordance with Section 3 of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), as a pesticide product. Refer to EPA approved product label for additional product hazard and precautionary information.

Canadian PCP: *Tim-bor Industrial/DPT* is registered with Health Canada's Pest Management Regulatory Agency (PMRA) under the Pest Control Products Act (PCP) (PCP Reg. No. 18879).

Chemical inventory listing: Disodium octaborate tetrahydrate (*Tim-bor Industrial*), 12280-03-4, appears on several chemical inventory lists (including the EPA TSCA inventory, Canadian DSL, European EINECS, Japanese MITI, Australian and Korean lists) under the CAS No. representing the anhydrous form of this inorganic salt.

U.S. EPA TSCA Inventory	12008-41-2
Canadian DSL	12008-41-2
EINECS	234-541-0
South Korea	9312-3213

RCRA: Disodium octaborate tetrahydrate is not listed as a hazardous waste under any sections of the Resource Conservation and Recovery Act (RCRA) or regulations (40 CFR 261 *et seq.*).

California Proposition 65: Disodium octaborate tetrahydrate (*Tim-bor Industrial*) is not listed on the Proposition 65 list of carcinogens or reproductive toxicants.

Superfund: CERCLA/SARA. Disodium octaborate tetrahydrate is not listed under CERCLA or its 1986 amendments, SARA, including substances listed under Section 313 of SARA, Toxic Chemicals, 42 USC 11023, 40 CFR 372.65, Section 302 of SARA, Extremely Hazardous Substances, 42 USC 11002, 40 CFR 355, or the CERCLA Hazardous Substances list, 42 USC 9604, 40 CFR 302.

Safe Drinking Water Act (SDWA): Disodium octaborate tetrahydrate is not regulated under the SDWA, 42 USC 300g-1, 40 CFR 141 *et seq.* Consult state and local regulations for possible water quality advisories regarding boron compounds.

Clean Water Act (CWA) (Federal Water Pollution Control Act): 33 USC 1251 *et seq.*

- Disodium octaborate tetrahydrate (*Tim-bor Industrial*) is not itself a discharge covered by any water quality criteria of Section 304 of the CWA, 33 USC 1314.
- It is not on the Section 307 List of Priority Pollutants, 33 USC 1317, 40 CFR 129.
- It is not on the Section 311 List of Hazardous Substances, 33 USC 1321, 40 CFR 116.

Canadian drinking water guideline: An "Interim Maximum Acceptable Concentration" (IMAC) for boron is currently set at 5 mg B/L.

IARC: The International Agency for Research on Cancer (IARC) (a unit of the World Health Organization) does not list or categorize disodium octaborate tetrahydrate as a carcinogen.

NTP Biennial Report on Carcinogens: Disodium octaborate tetrahydrate is not listed.

OSHA carcinogen: Disodium octaborate tetrahydrate is not listed.

Clean Air Act (Montreal Protocol): *Tim-bor Industrial* was not manufactured with and does not contain any Class I or Class II ozone depleting substances.

16 Other information

References

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- Butterwick L, de Oude N, Raymond K. *Ecotoxicol. Environ. Safety* 17: 339-371 (1989).

For general information on the toxicology of inorganic borates, see Patty's Industrial Hygiene and Toxicology, 4th Ed. Vol. II, (1994). Chap. 42, Boron; ECETOC Tech. Report No. 63 (1995).

Product label text hazard information:

Refer to EPA (United States) or PMRA (Canada) approved product specimen label for additional product hazard and precautionary information.

For further information contact:

U.S. Borax Inc.

Health & Safety
(661) 287-6050

Technical & Sales Support
(661) 287-6022

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format) For Cornell University Convenience Only

ZPW WOOD PRESERVATIVE, 930-933

<u>Section 1 - Product and Company Identification</u>	<u>Section 9 - Physical & Chemical Properties</u>
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Section 1 - Product and Company Identification ZPW WOOD PRESERVATIVE, 930-933

Product Identification: ZPW WOOD PRESERVATIVE, 930-933
Date of MSDS: 11/02/1989 **Technical Review Date:** 04/30/1996
SC: 8030 **NIIN:** LIIN: 00N020715
Submitter: N EN
Status Code: C
IFN: 02
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: JASCO CHEMICAL
Post Office Box: J
Manufacturer's Address1: 1710 VILLA ST
Manufacturer's Address2: MOUNTAIN VIEW, CA 94042

Manufacturer's Country: US
General Information Telephone: 415-968-6005
Emergency Telephone: 800-424-9300 (CHEMTREC)
Emergency Telephone: 800-424-9300 (CHEMTREC)
M S Preparer's Name: JCZ
Proprietary: N
Reviewed: N
Published: Y
CAGE: FO802
Special Project Code: N

Contractor Information

Contractor's Name: JASCO CHEMICAL
Post Office Box: J
Contractor's Address1: 1710 VILLA STREET
Contractor's Address2: MOUNTAIN VIEW, CA 94042
Contractor's Telephone: (415) 968-6005
Contractor's CAGE: FO802

Contractor Information

Contractor's Name: JASCO CHEMICALS
Post Office Box: J
Contractor's Address1: 1710 VILLA ST
Contractor's Address2: MOUNTAIN VIEW, CA 94042
Contractor's Telephone: 415-968-6005, 800-424-9300
Contractor's CAGE: 9B440

Section 2 - Composition/Information on Ingredients ZPW WOOD PRESERVATIVE, 930-933

Ingredient Name: ZINC NAPHTHENATE; (ZINC NAPHTHENATE SOLUTION; M-GARD W552)
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: RTECS Code: X
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 25
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) OSHA PEL Code: M
OSHA STEL: OSHA STEL Code:
A III TLV: 5 MG/M3 (MFR) ACGIH TLV Code: M
ACGIH STEL: N/P ACGIH STEL Code:
EPA Reporting Quantity:
DOT Reporting Quantity:

Section 3 - Hazards Identification, Including Emergency Overview
ZPW WOOD PRESERVATIVE, 930-933

Health Hazards Acute & Chronic: INHALATION: MAY CAUSE DIZZINESS, FATIGUE, HEADACHE. SKIN/EYE: IRRITANT. SKIN ABSORPTION: REDNESS, DEFATTING, DERMATITIS. INGESTION: MAY CAUSE GASTROINTESTINAL TRACT, IRRITATION, NAUSEA, VOMITING AND DIARRHEA.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
SOME SKIN CONDITIONS MAY BE AGGRAVATED.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:

Inhalation: YES

Skin: YES

Ingestion: YES

Carcinogenicity Indicators

NTP: NO

IARC: NO

OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT

Section 4 - First Aid Measures
ZPW WOOD PRESERVATIVE, 930-933

First Aid:

SKIN: FLUSH WITH WATER FOR AT LEAST 15 MINUTES. SEEK MEDICAL ATTENTION IF IRRITATION PERSISTS. EYES: FLUSH WITH WATER FOR AT LEAST 15 MINUTES. SEEK MEDICAL ATTENTION IF IRRITATION PERSISTS. INHALATION: REMOVE TO FRESH AIR. RESTORE BREATHING IF NECESSARY. SEEK MEDICAL ATTENTION IF IRRITATION PERSISTS. INGESTION: DO NOT INDUCE VOMITING. SEEK MEDICAL ATTENTION.

Section 5 - Fire Fighting Measures
ZPW WOOD PRESERVATIVE, 930-933

Fire Fighting Procedures:

USE NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).

Unusual Fire or Explosion Hazard:

VAPORS ARE HEAVIER THAN AIR AND MAY BE MOVED BY AIR CURRENTS TO DISTANT IGNITION SOURCES.

Extinguishing Media:

ALCOHOL FOAM, CARBON DIOXIDE, DRY CHEMICAL.

Flash Point: Flash Point Text: >200F,>93C

Autoignition Temperature:

Autoignition Temperature Text: N/A

Lower Limit(s): N/A

Section 6 - Accidental Release Measures
ZPW WOOD PRESERVATIVE, 930-933

Spill Release Procedures:

CONTAIN AND ABSORB WITH INERT MATERIAL.

Section 7 - Handling and Storage
ZPW WOOD PRESERVATIVE, 930-933

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
ZPW WOOD PRESERVATIVE, 930-933

Respiratory Protection:

NIOSH/MSHA APPROVED RESPIRATOR IF TLV IS EXCEEDED.

Ventilation:

LOCAL EXHAUST IS PREFERABLE AND MECHANICAL EXHAUST IS ACCEPTABLE.

Protective Gloves:

NEOPRENE.

Eye Protection: ANSI APPROVED CHEM WORKERS GOGGLES (FP N).

Other Protective Equipment: ANSI APPROVED EYE WASH & DELUGE SHOWER (FP N).

Work Hygienic Practices: DO NOT EAT, DRINK OR SMOKE AROUND PRODUCT. WASH HANDS AFTER USE.

Supplemental Health & Safety Information: NONE SPECIFIED BY MANUFACTURER.

Section 9 - Physical & Chemical Properties
ZPW WOOD PRESERVATIVE, 930-933

HCC:

NRC/State License Number:

Net Property Weight for Ammo:

Boiling Point: Boiling Point Text: 230F, 110C

Melting/Freezing Point: Melting/Freezing Text: N/K

Decomposition Point: Decomposition Text: N/K

Vapor Pressure: N/K **Vapor Density:** HVR/AIR

Percent Volatile Organic Content:

Specific Gravity: 1.0 (H₂O=1)

Volatile Organic Content Pounds per Gallon:

pH: N/K

Volatile Organic Content Grams per Liter:

Viscosity: N/P

Evaporation Weight and Reference: N/A

Solubility in Water: COMPLETE

Appearance and Odor: WHITE LIQUID; SLIGHT SWEET ODOR.

Percent Volatiles by Volume: N/K

Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data

Stability Indicator: YES

Materials to Avoid:

IRON MONOXIDE, CARBON DIOXIDE, VARIOUS HYDROCARBONS.

Stability Condition to Avoid:

NONE KNOWN.

Hazardous Decomposition Products:

NONE KNOWN.

Hazardous Polymerization Indicator: NO

Conditions to Avoid Polymerization:

NOT RELEVANT

Section 11 - Toxicological Information
ZPW WOOD PRESERVATIVE, 930-933

Toxicological Information:

N/P

Section 12 - Ecological Information
ZPW WOOD PRESERVATIVE, 930-933

Ecological Information:

N/P

Section 13 - Disposal Considerations
ZPW WOOD PRESERVATIVE, 930-933

Disposal Methods:

DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

Section 14 - MSDS Transport Information
ZPW WOOD PRESERVATIVE, 930-933

Transport Information:

N/P

Section 15 - Regulatory Information
ZPW WOOD PRESERVATIVE, 930-933

MSHA Title III Information:

N/P

Federal Regulatory Information:

N/P

State Regulatory Information:

N/P

Section 16 - Other Information
ZPW WOOD PRESERVATIVE, 930-933

Other Information:

N/P

HAZCOM Label Information

Product Identification: ZPW WOOD PRESERVATIVE, 930-933

AGE: FO802

Assigned Individual: Y

Company Name: JASCO CHEMICAL
Company PO Box: J
Company Street Address1: 1710 VILLA STREET
Company Street Address2: MOUNTAIN VIEW, CA 94042 NK
H h Emergency Telephone: 800-424-9300 (CHEMTREC)
Label Required Indicator: Y
Date Label Reviewed: 04/30/1996
Status Code: C
Manufacturer's Label Number:
Date of Label: 04/30/1996
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Moderate
Fire Hazard: Slight
Reactivity Hazard: None

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*Confidential Report To
Canada Mortgage and Housing Corporation*

*Final Report -
Environmental Chamber Testing of Emissions
From Non-CCA Treated Wood*

PROPOSAL PUBLICATION AUTHORIZATION FORM

ALL DOCUMENTS

Date March 8, 2005

Project Leader Completes

Title FINAL REPORT - Environmental Chamber Testing of Emissions From
Non-CCA Treated Wood

Author(s) Jerry Makohon, Rob Dumont, Wo Yuen

Client CMHC

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WOOD PRODUCT

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WOOD PRODUCT

CODE 2

ACQ - D

WOOD PRODUCT

CODE 2

ACQ - D

WOOD PRODUCT

CODE 3

Copper naphthenate

WOOD PRODUCT

CODE 3

Copper naphthenate

WOOD PRODUCT

CODE 3

Copper naphthenate

WOOD PRODUCT

CODE 4

Creosote

WOOD PRODUCT

CODE 5

Copper azole

WOOD PRODUCT

CODE 6

CCA

WOOD PRODUCT

CODE 7

Sodium borate

WOOD PRODUCT

CODE 8

Zinc naphthenate

WOOD PRODUCT

CODE 9

Untreated wood

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