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

MAR 13 1992

Dr. James Russell
Special Consultant to the
Pulp Chemicals Association, Inc.
2938 Jenks Avenue
Panama City, Florida 32405

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

CONTAINS NO CBI

Dear Dr. Russell:

It was a pleasure to meet with you and Dr. Frank Lambert on February 18, 1992. This letter confirms the Agency's intent to incorporate all Toxic Substances Control Act (TSCA) Chemical Substance Inventory references to tall-oil rosin (Chemical Abstracts Service Registry Number 8052-10-6) into rosin (CASRN 8050-09-7) as well as polymers and reaction products made from them.

The TSCA Chemical Substance Inventory currently lists both tall-oil rosin (CASRN 8052-10-6) and rosin (CASRN 8050-09-7), the names of which have been interchangeably used by manufacturers to describe rosins and their derivatives. The Pulp Chemicals Association (PCA) requested that the Agency consider CASRN 8052-10-6 (tall-oil rosin) and CASRN 8050-09-7 (rosin) equivalent for the purpose of the TSCA Chemical Substance Inventory, using CASRN 8050-09-7 (rosin) to describe both.

We have carefully studied the issue and decided that, for the purposes of the TSCA Inventory, rosin (CASRN 8050-09-7) will cover all types of rosin, irrespective of their method of production or the mixture of rosin used. We acknowledge that during the Initial Inventory reporting period EPA and industry might have agreed to use one CASRN 8050-09-7 (rosin) to cover all types of rosin. However, such agreement was never implemented when the TSCA Inventory was compiled. While we regret that PCA failed to bring this issue to our attention earlier, we now believe that the TSCA Inventory should no longer distinguish between rosin and tall-oil rosin.

Based on our discussion on February 18, the aforementioned change will be made retroactively so that all references to tall oil rosin will be removed from the TSCA Inventory upon completion of proper Inventory correction and delisting requirements. The tentative Inventory correction/delisting procedures that we intend to follow are summarized as follows:

(1) The Agency will consolidate both tall-oil rosin (CASRN 8052-10-6) and rosin (CASRN 8050-09-7) under one single definition for rosin which will still be identified by CASRN 8050-09-7.

(2) The Pulp Chemicals Association will notify its member companies that rosin and tall-oil rosin are being treated equivalently, for the purposes of TSCA Inventory. Future Premanufacture Notifications (PMNs) for new substances based on rosin should use CASRN 8050-09-7 (rosin) only, irrespective of the type of rosins used.

(3) The Pulp Chemicals Association will notify its member companies who reported substances containing tall-oil rosin during the Initial Inventory reporting period to submit TSCA Inventory correction request(s) to the Chemical Inventory Section (TS-790) of EPA. The member companies should in turn notify their customers who may have reported substances (including polymers, reaction products, and derivatives) based on tall-oil rosin to likewise submit correction requests, if necessary. Each correction request is to be made on a new Inventory Reporting Form C along with a copy of the original Inventory reporting form. The confidentiality claims, activity and production range information should be the same in both original Form C and new Form C. A cover letter should also be included to authorize the Agency to make the Inventory correction. The supporting documentation (such as commercial batch production records, customer invoices etc.) which is normally required to accompany an Inventory correction request will be waived for the aforementioned correction requests.

(4) The PCA member companies and the downstream processors who reported tall-oil rosin containing substances (including polymers, reaction products, and derivatives) in PMNs should also submit correction requests to the Chemical Inventory Section (TS-790) of EPA for both commenced and uncommenced PMNs. The package of the correction request should include new page(s) of Section B (Chemical Identity Information) in Part I of the EPA PMN Form 7710-25, a copy of the corresponding original PMN page(s), and a cover letter to authorize the Agency to make the correction(s) from tall-oil rosin containing substance(s) to rosin containing substance(s). Again, the supporting documentation requirements as mentioned in (3) will be waived.

(5) After the Agency approves the valid correction requests, the chemical name, "tall-oil rosin", would be changed to "rosin" in the affected substances in question. New CAS Registry Numbers will be assigned to the corrected substances and placed on the TSCA Chemical Substance Inventory.

(6) EPA will proceed to delist from the TSCA Inventory by formal Inventory delisting procedures those substances that were previously identified as tall-oil rosin derivatives.

Please be advised that our decision to consolidate the rosin and tall-oil rosin will impact other inventories, especially the Canadian Domestic Substances List (DSL) and Non-Domestic Substances List (NDSL), which is based on the 1985 Edition of the TSCA Inventory. Following the aforementioned TSCA Inventory Correction and delisting process, some corrected substances which are to be included in the TSCA Inventory may no longer be listed in the Canadian Inventory as a result of the change in chemical name. Likewise, the delisting of tall-oil rosin and its derivatives from the TSCA Inventory could create a compliance problem for persons who import those substances to Canada. Furthermore, the Chemical Abstracts Service (CAS) will continue to generate separate CAS Registry Numbers for substances containing rosin and tall-oil rosin, to support their routine abstracting, indexing, and Registry Services, which in turn supports other governmental organizations. Please note that EPA has no control over these CAS activities which are not related to the performance of the Agency's TSCA Inventory contract with CAS.

As I pointed out to Dr. Frank Lambert during a telephone conversation of March 12, 1992, the rosin industries perhaps should re-evaluate the ramifications of implementing the aforementioned correction/delisting procedures. If there are strong industry objections to the delisting of tall-oil rosin and derivatives from the TSCA Inventory, the Agency will not be able to proceed with the delisting and the Inventory would still contain both names. Consequently, the benefits that PCA anticipates from this correction will not be realized, while the confusion surrounding the use of the two names will become even more significant. I understand that Dr. Lambert will bring this matter to the attention of PCA member companies in the forthcoming PCA meeting. PCA will then advise EPA whether we need to re-examine our position regarding this issue.

In closing, we thank you again for your patience and cooperation in resolving this complex matter.

Sincerely,

Henry P. Lau, Chief
Chemical Inventory Section

JR-Copy

JAMES RUSSELL

CONSULTANT

2938 JENKS AVENUE
PANAMA CITY, FL 32405
(904) 785-9961 Fax: 904-784-6600

September 17, 1991

To:

Herb Arlt Jr., Arizona Chemical Company
Charles Johnson, Arizona Chemical Company
George Anderson, Georgia Pacific Corporation
Terry Zitzelberger, Hercules Incorporated
Mary Ellen Einstein, Hercules Incorporated
Nelson Lawson, Union Camp Corporation
Carl W. Bailey III, Westvaco Corporation
Bernie Beasley, Westvaco Corporation
Frank Lambert, Westvaco Corporation

Colleagues:

Enclosed is your copy of the letter sent today to the EPA regarding the CASRN of rosin.

Some minor changes have been made to the April 8, 1991 letter to make the wording acceptable to the full committee and the enclosed letter has been approved orally by all member companies.

Sincerely yours,

James Russell

Enc.

PULP CHEMICALS ASSOCIATION

P.O. BOX 105113 • ATLANTA, GA 30348-5113 • (404) 446-1290 • FAX (404) 446-6947

September 17, 1991

Mr. Mark A. Greenwood
Director
Office of Toxic Substances
U.S. EPA
401 M Street S.W.
Washington, DC 20460

Dear Mr. Greenwood:

This letter is to bring to the attention of the Environmental Protection Agency the presence of two CAS Registry Numbers applicable to rosin in the Toxic Substances Control Act Inventory of Chemical Substances and to ask the EPA to meet with representatives of the Pulp Chemicals Association to establish a program to resolve this anomaly and the problems, such as the appropriate definition of rosin derivatives, that have resulted.

In support of this request, I am presenting background information which upholds the Pulp Chemicals Association's view that only one single CASRN, 8050-09-7 is necessary to define rosin, irrespective of its method of production.

The PCA recommended solution for correcting this anomaly is to incorporate all Inventory references to tall oil rosin CASRN 8052-10-6 into rosin CASRN 8050-09-07. This solution would be consistent with the decisions reached in 1977-78 between the EPA and the PCA. It would be consistent with the industry's experience that all rosins are chemically interchangeable for the production of rosin derivatives and that economics, not chemical composition, is the factor governing which rosin is used. This solution would simplify the Inventory by reducing the number of current listings and future PMNs.

In support of this solution, I am including:

1. A description of the Pulp Chemicals Association, its charter and its activities.

2. A brief summary of the chemistry of rosin, how it is produced and its commercial application.

3. Comments on the economic significance of rosin in the United States.

4. A review of the discussions held in 1978-79 within the Pulp Chemicals Association and between the PCA and the EPA. The purpose of these discussions was, among other things, to establish a single, mutually acceptable definition and a single CASRN covering all types of rosin.

5. Examples of the type of ambiguity and problems encountered by both producers and consumers of tall oil rosin, arising from the inclusion of multiple CASRN in the Inventory.

After studying this letter, please contact me by phone (904) 785-9961 or by mail to propose a time and place where a small delegation from the Pulp Chemicals Association can meet with you and members of your staff to discuss a program to resolve this problem.

THE PULP CHEMICALS ASSOCIATION, INC.

The Pulp Chemicals Association, Inc. (PCA) is a trade association composed of the major producers and fractionators of crude tall oil and crude sulfate turpentine and other parties with a strong interest in these products. Its members represent an important part of the Naval Stores Industry, a world wide industry whose products are based on chemicals derived from the pine tree. A brochure describing the Association is attached (Appendix 1).

The producer member of the Association are members of the pulp and paper industry including Bowaters, Champion International, Georgia-Pacific Corporation, Gilman Paper, ITT Rayonier, Mead, Stone Container, Union Camp, Westvaco and Weyerhaeuser. Tall oil fractionation members are Arizona Chemical, Georgia Pacific, Hercules, Union Camp and Westvaco. These companies manufacture all the tall oil rosin produced in the United States.

The Association sponsors many meetings and conferences in the areas of interest to its members and is the accepted world source of information related to the Naval Stores Industry. For example, the Association sponsors the Annual international Naval Stores Meetings which attract some 300 delegates from 25 different countries. This meeting has become the foremost meeting in the world for reviewing the status and trends in the Naval Stores Industry.

The Association maintains several working committees that meet regularly to discuss topics of mutual but non-confidential interest. Typical of these varied committee activities is the development of new and improved chemical analytical techniques, improved tall oil and turpentine recovery techniques, discussion of safety and environmental improvements, the collection and dissemination of production and utilization statistics of tall oil and turpentine products. The Association also has a joint committee with the ASTM's subcommittee DO 1.34 Naval Stores, to ensure that industry analytical standards are reliable, up-to-date and internationally acceptable.

The discussion and implementation of government regulations has long been an Association activity. Thus, when in 1977 the EPA announced its plans to compile the Inventory of Chemical Substances as part of the Toxic Substances Control Act, the Association formed its TSCA Committee to help its members, and the Naval Stores Industry, ensure that all eligible chemical substances were reported for the original Inventory. How this committee functioned and how it interfaced with the EPA will be described later in this letter.

Another important and successful function of the Association is the publication of technical books on the Naval Stores Industry and its products and its practices. A listing of these books is included in the attachments to this letter (Appendix 2) and copies of relevant sections are included to provide support and background to this letter.

ROSIN AND IT'S USES

Rosin is the most important product of the naval stores industry with world production being about 1.2 million tons annually. Roughly 700,000 tons of this total are gum rosin 400,000 tons tall oil rosin and 100,000 tons are wood rosin. In the United States, rosin production totals 284,000 tons annually. Of this, 40,000 tons is estimated to be wood rosin, 3,000 tons gum rosin and 241,000 tons tall oil rosin.

Rosin is a component of pine trees throughout the world and there are three processes for recovering the rosin from the tree. Slashing the tree, collecting the exudate and distilling away the volatile components yields gum rosin. Solvent extracting wood chips and evaporating the solvent yields wood rosin. Stumps that have been in the ground for many (say 20) years are the preferred source of wood for the production of this type of rosin. The third type of rosin is tall oil rosin. This rosin is obtained by the fractional distillation of tall oil, a by-product of the process for pulping of pine wood.

Thus, with all three types of rosin, the raw material is the same - the pine tree. Any differences in composition that occur are due to the different ways in which the rosin is extracted from the tree. Thus, all three rosins contain the same rosin acids (see Appendix 3). However, the levels at which the various rosin acids are present depends upon the processing conditions, especially the temperature, to which the rosin has been exposed. This variation in the level of the various rosin acids is one of the differences between the three types of rosin.

The other difference between the three types of rosin is in their non-rosin acid components. For example, gum and wood rosin contain small amounts of terpene hydrocarbons, with the specific hydrocarbons depending on the species of tree from which the rosin is extracted. Tall oil rosin also contains small amounts of these terpenic hydrocarbons and in addition contains small amounts of fatty acids and sulfur containing compounds. Thus small, although for marketing purposes significant, differences exist between the three rosins. However as technology has improved the level of non-rosin acid components in all three rosins has decreased and the three types of rosin are now interchangeable for rosin's most important commercial use, the production of derivatives.

It is beyond the scope of this letter to detail the chemistry of rosin and the production of derivatives. This subject is well documented in the books listed in Appendix 2. However, it should be mentioned that only relatively small amounts of rosin are used in an unmodified form. Virtually all rosin is modified in some way or converted into derivatives, for use in a variety of markets.

The largest single use for rosin is in the production of printing ink resins. For this market, rosin is converted into high softening point products such as metal salts, esters of rosin adducts and rosin phenolics. The second largest market is paper size where rosin, or a rosin adduct, is converted to a sodium or potassium salt.

Adhesive tackifiers are the third largest market for rosin with non-crystallizing rosin and rosin esters, especially the pentaerythritol ester, being the major products. The fourth largest market for rosin is the use of disproportionated rosin, or more precisely, its sodium or potassium salt as an emulsifying agent for the production of synthetic rubber. Another large market for rosin is in the production of chewing gum base where the glycerol ester finds widespread use.

In all these end uses, commercially acceptable derivatives can be made from all three types of rosin. Thus, in commercial practice, the selection of the rosin, or the mixture of rosins to be used as a starting material, is based primarily on economics because the chemical composition of each rosin is so similar.

ECONOMIC IMPORTANCE OF ROSIN

As mentioned previously, rosin and its derivatives find uses in several important markets and as such have become key ingredients in a wide variety of end use products. Although in most of these end use products, rosin and its derivatives are not the major component, they impart an important characteristic to the product and are essential to the satisfactory performance of that product. Thus, it is important that no questions remain concerning the CASRN of rosin or its derivatives and their listing in the Toxic Substances Control Act Inventory of Chemical Substances.

The role that rosin plays as a raw material and its subsequent economic impact can best be illustrated by considering how the value of rosin products used in the United States increases as they are converted into derivatives and how these in turn are used in end use products. Thus, consumption of rosin in the United States in 1990 was estimated to be about 300,000 short tons of which about 240,000 short tons were tall oil rosin. Assuming an average value of $500/ton, this rosin has a total value of $150 million.

However, almost all this rosin is upgraded to give the products mentioned earlier. The selling price of these rosin based products is in the range of 30¢/lb to $1.00/lb and a reasonable average selling price would be 60¢/lb. Assuming no change in yield during upgrading, the value of the rosin based products is now more than double the raw material value and now has a value of $360 million.

Even though that value is substantial, the actual economic significance of rosin is many times greater than $360 million, as rosin derivatives are used at low levels in such a wide variety of end use products. For example, rosin size is used at less than a 1% level in the manufacture of paper and rosin based emulsifiers are used at less than a 5% level in the production of synthetic rubber. Printing inks and adhesives use higher levels of rosin based derivatives but they in turn are applied to a variety of substrates to produce final products. The total value of products manufactured in the U.S. that contain rosin or its derivatives is well over $50 billion (see Appendix 4).

It is appropriate to mention that no suitable economically attractive alternatives to rosin derivatives are available. Synthetic paper size is available but is more expensive than rosin size. Other emulsifiers for the production of synthetic rubber are available but they do not impart the same desirable characteristics to the rubber. Hydrocarbon based resins are available for use in printing inks and adhesives but in many applications the more polar, higher softening point rosin based products are more effective and more economically attractive.

Thus, rosin and its derivatives are spread diffusely through many end use products. Every manufacturer of those products has to be assured that the rosin based product he is using has an unequivocal CASRN which is listed in the Inventory of Chemical Substances. It is, therefore important to the rosin industry that any anomalies associated with the CASRN of rosin and its derivatives be resolved.

HISTORY

In May of 1977, William Librizzi of Region II of the EPA wrote to the PCA (Appendix 5) announcing that a Candidate List of existing chemical substances had been published by the EPA and asked the PCA to notify its membership of the availability of that list. That Candidate List included Rosin CASRN 8050-09-7. It did not include any separate listing for tall oil rosin (Appendix 6).

As a service to its membership, the PCA formed a TSCA committee to ensure that the basic products of the industry would be included in the Inventory of Chemical Substances and to develop definitions of those basic substances. This committee met on July 28, 1977 and the definitions that were agreed to at that meeting were listed in a letter to the committee members from D. E. Campbell of the PCA., dated August 17, 1977 (Appendix 7).

Rosin was defined as "a complex combination consisting predominantly of rosin acids, or modified rosin acids such as dimers or decarboxylated rosin acids, which have been derived from wood, especially pine wood. The balance of the material is neutral materials and fatty acids." The possibility of having separate definitions for wood, gum and tall oil rosin was discussed but the committee decided that as the three rosins were similar in composition and essentially interchangeable as raw materials, one definition and one CASRN should be proposed. It certainly appeared that rosin satisfied the EPA's definition of a Class 2 material, published in the instructions for reporting for the Initial Inventory, as its composition cannot be represented by a definite chemical structure. Further, as a consequence of its variable composition resulting from the different pinewood species used as raw material and the different processing conditions used in its production, rosin meets the EPA's definition of a UVCB substance. Therefore, even though the names gum rosin, wood rosin and tall oil rosin would continue to be used for commercial purposes, only one definition (and one CASRN) was required to cover all three rosins.

On August 30, 1977 the TSCA committee met in Washington with Drs. Semeniuk, Gusman and Mazza of the EPA to discuss these definitions. Subsequent to that meeting, the list of definitions was submitted to the EPA by the PCA on September 7, 1977 (Appendix 8). The definition of rosin was unchanged and it can be noted that the covering letter refers to "tall oil products." Obviously the intent was that tall oil rosin was included in the given description of rosin (CASRN 8050-09-7).

Following that meeting, and presumably as a result of discussions at that meeting, definitions of other rosin based products were developed by the PCA's TSCA Committee. This list included disproportionated rosin, the glycerol ester of rosin and the pentaerythritol ester of rosin (Appendix 9).

On December 2, 1977, additional definitions were submitted to the EPA (Appendix 10). Only the additional definitions were submitted to the EPA and so the previous definitions, including that for rosin were not changed.

However, it is relevant to note that a full list of definitions (Appendix 11) prepared for the members of the PCA about this same time, specifically states that CASRN 8050-09-7 is designed to cover tall oil, wood and gum rosin. Although this internal document is not dated, the definitions of rosin esters used, places it as being prepared in late 1977 or early 1978. This again is strong evidence that the intent of the PCA, in conjunction with the EPA, was to cover all rosins with one description and one CASRN.

No further meetings were held between the EPA and the PCA's TSCA committee. However, the final definitions were discussed in two long (several hour) phone conversations one Saturday and one Sunday in January, 1978 between Dr. H. G. Arlt Jr., Technical Director of Arizona Chemical Company and Dr. George Semeniuk of the EPA. Although no record of those conversations is available, it is Dr. Arlt's recollections that Dr. Semeniuk felt the chemical modifications of rosin changed the chemical nature of rosin sufficiently to warrant a separate CASRN. However, he agreed that a single CASRN was satisfactory for rosin and

disproportionated rosin irrespective of the source of the rosin or the method of disproportionation used.

Thus, when Addendum III of the Candidate List was published in March, 1978, rosin (CASRN 8050-09-7) was defined as "A complex combination derived from wood, especially pine wood. Composed primarily of rosin acids and modified rosin acids such as dimers and decarboxylated rosin acids. Includes rosin stabilized by catalytic disproportionation." (See Appendix 12).

The same definition for rosin was listed in the Initial Inventory of Chemical Substances when it was published in May, 1979. However, a separate definition of tall oil rosin with a separate CASRN (8052-10-6) also was listed in the Inventory!

A recent request to the EPA under the Freedom of Information Act resulted in establishing that 62 reporting locations had reported rosin with the CASRN 8050-09-7 and only two had used tall oil rosin CASRN 8052-10-6. All the fractionators of tall oil (i.e., producers of tall oil rosin) had used 8050-09-7. The two reporting locations which used CASRN 8052-10-6 were listed as importers.

Thus, in spite of the joint efforts and the intentions of the Pulp Chemicals Association and the EPA, two separate CASRN covering tall oil rosin were included in the Inventory. Subsequently this duplication resulted in serious questions being raised about the correct CASRN for tall oil rosin and its derivatives.

There is no doubt that the Pulp Chemicals Association and the EPA intended that one CASRN would include a given derivative of rosin irrespective of whether the raw material was tall oil, gum or wood rosin or mixtures of the three.

Incidentally, it is worth noting in passing that the wording used for esters of rosin agreed to and published in Addendum III had been changed when published in the Initial Inventory. In Addendum III the wording was, for example, "Rosin, Pentaerythritol Ester" whereas in the Initial Inventory the wording was "Resin acids and Rosin acids, esters with pentaerythritol". This change in wording seemed to little significance at the time but later served to complicate matters as it ultimately led to another CASRN for rosin i.e., 73138-82-6 Resin acids and Rosin acids.

CONSEQUENCES OF MULTIPLE CASRN

Problems have developed since the Initial Inventory was published due to the listing of multiple CASRN covering rosin. Although the intent of the PCA was to use one CASRN for rosin (8050-09-7), customers and non-PCA members were, and still are, unsure about which number to use. Even PCA members became unsure as staff changes occurred and new regulatory personnel were appointed.

A variety of problems can develop and the following hypothetical examples illustrate the type of confusion that occurs. For example, a company develops a new product based on tall oil rosin and uses two existing suppliers of tall oil rosin. Supplier A says the CASRN of tall oil rosin is 8050-09-7 and Supplier B says it is 8052-10-6. Although the two rosins are chemically indistinguishable, to ensure compliance with TSCA regulations, the company files two PMN's. However, when production starts the company is faced with the question of whether separate storage facilities are required for the two tall oil rosins and whether products made from mixtures of the two rosins are covered by the PMN's that were filed.

A second example is that of a company which decides to enter an old and well established market for a rosin derivative and develops a product based on tall oil rosin. Examination of the Inventory shows that no derivative specifically based on tall oil rosin is listed although he knows that such a product has been produced commercially and sold for over 25 years. If he files a PMN for a new product, his customer will be concerned that the product, ostensibly the same as he has been buying for many years, has a different CASRN. Thus, he is less likely to purchase the product from that supplier.

These two examples illustrate the confusion that can be caused. The producers and consumers of rosin are eager to eliminate the problems and confusion that interfere with normal customer supplier relations. Thus, the Pulp Chemicals Association was asked, on behalf of its members, to approach the EPA with a view to resolving this problem.

RECOMMENDATIONS

The PCA recognizes that no simple solution to this problem exists but it also realizes that the longer this problem continues the more difficult will be its resolution.

The PCA recommended solution for correcting this problem is to incorporate all Inventory references to tall oil rosin CASRN 8052-10-6 into rosin CASRN 8050-09-7. This solution would be consistent with the decisions reached in 1977-78 between the EPA and the PCA. It would be consistent with the industry's experience that all rosins are generally interchangeable for the production of rosin derivatives and that economics, not chemical composition, is the factor governing which rosin is used.

The PCA also requests that the recommended change be made retroactive to 1977-78 so that all references to tall oil rosin will be eliminated from the Inventory. Future PMN's for new substances based on rosin could then use CASRN 8050-09-7 and only that CASRN irrespective of the type or mixture of rosins used. The change would not only eliminate the confusion caused by multiple CASRN, it would simplify the Inventory.

Finally it should be mentioned that even though the PCA recommends that one and only one CASRN be used for Inventory purposes, it expects that its member companies will continue to use the designations gum, wood and tall oil to describe its rosin products whenever commercially appropriate. These designations have been used in the past and it can be expected that they will continue to be used in the future.

With this background, the PCA is asking that a small delegation from its membership meet with you and members of your staff to discuss this entire problem and jointly develop a solution. The PCA and the EPA worked well together in 1977-78. We look forward to doing the same in 1991.

Sincerely,

James Russell

James Russell
Special Consultant to the
Pulp Chemicals Association, Inc.
2938 Jenks Avenue
Panama City, FL 32405
Phone: (904) 785-9961
Fax: " 784-6600

pc: WHGross, PCA

APPENDIX 2

Books published by the Pulp Chemicals Association

Tall Oil and its Uses - Edited by L.G. Zachary, H.W. Bajak, and F.J. Eveline, 1965

Sulfate Turpentine Recovery - by: J. Drew, J. Russell and H.W. Bajak, 1971

Tall Oil - by: J. Drew and M. Probst, 1981

Tall Oil and its Uses II - by: E.E. McSweeney, H.G. Arlt Jr., and J. Russell, 1987

Naval Stores: Production, Chemistry Utilization - Edited by D.F. Zinkel and J. Russell, 1989

APPENDIX 3.

Table 5. Typical Rosin Compositions

Components	*Gum*	*Wood*	*Tall Oil*
Pimaric	2	3	3
Palustric	18	10	10
Isopimaric	18	11	7
Abietic	20	45	35
Dehydroabietic	4	8	20
Neoabietic	18	7	4

From Tall Oil and Its Uses II by E.E. McSweeney, H.G. Arlt Jr., and J. Russell. Published by Pulp Chemicals Association, New York City, 1987

APPENDIX 4

ECONOMIC IMPACT OF ROSIN IN U.S.A.

MAJOR ROSIN DERIVATIVE MARKETS

	SIC#	Annual Sales $ Billions
Printing Ink Resins	2893	2.4
Sized Paper		49.9
Adhesives and Sealants	2891	4.3
Synthetic Rubber	2822	3.5

Other important markets using rosin and rosin derivatives are chewing gum, protective coatings, corrosion inhibitors, oil field chemicals and asphalt.

APPENDIX 5

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
EDISON, NEW JERSEY 08817

May 17, 1977

Pulp Chemicals Association
60 East 42nd Street
New York, New York 10017

Dear Sir:

Section 8(b) of the Toxic Substances Control Act requires that EPA establish an inventory of existing chemical substances. This inventory is extremely important, not only to EPA, but to industry since any chemical substance not on the list will be considered a new chemical substance and thus subject to the premanufacturing review process. The Agency, therefore, believes it essential that industry respond to this inventory requirement. In this regard, we are making available to industry a Candidate List of existing chemical substances to assist them in responding to the reporting requirements proposed by EPA in Federal Register Notices of March 9 and April 12. This List makes no distinction between toxic and innocuous chemicals.

Attached is a copy of a third Federal Register Notice entitled, "Notice of Availability" which outlines procedures that industry can take to receive a copy of the Candidate List. Several steps have also been taken at the Regional level to enhance the availability of the Candidate List. Copies are available for inspection at the EPA Regional Office, 26 Federal Plaza, New York, at the Edison Laboratory in Edison, New Jersey, and at our two field offices in Rochester, New York and San Juan, Puerto Rico. Copies are also available in the State Environmental Protection Agencies of New York, New Jersey, Puerto Rico and the Virgin Islands. Attached are their locations.

We would solicit your assistance in our task of disseminating this information. Please advertise to your membership the contents of the Notice of Availability. A number of copies of the Notice are

attached for your use in this dissemination. Any actions that you have already taken in this regard are appreciated. We would also appreciate any comments you might have on how we might effectively distribute Forms A and B which industry needs for reporting their existing chemical substances to EPA.

Thank you for your support. Please feel free to call me at (201) 321-6673 if you have any suggestions, questions or comments.

Sincerely yours,

William Librizzi

William Librizzi
Region II
Toxic Substances Coordinator

Enclosures:
Location Addresses
Federal Register Notice

APPENDIX 6

TOXIC SUBSTANCES CONTROL ACT (TSCA)

PL 94 — 469

CANDIDATE LIST OF CHEMICAL SUBSTANCES

VOLUME II

SUBSTANCE NAME SECTION (PART 2)

APRIL 1977

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF TOXIC SUBSTANCES
WASHINGTON, D.C. 20460

Syton Fast Red FRL [6410-35-1] B659-7012 $C_{24}H_{17}Cl_2N_3O_2$
Syton Fast Red FRLL [6410-38-4] B659-7125 $C_{24}H_{17}Cl_2N_3O_2$
Syton Fast Red R [2814-77-9] B659-7231 $C_{16}H_{10}ClN_3O_3$
Syton Fast Rubine FBH [6535-48-4] B659-7342 $C_{25}H_{17}Cl_2N_3O_2$
Syton Fast Scarlet RB [2425-85-6] B659-7454 $C_{17}H_{13}N_3O_3$
Syton Fast Scarlet RD [2425-85-6] B659-7575 $C_{17}H_{13}N_3O_3$
Syton Fast Scarlet RN [2425-85-6] B659-7682 $C_{17}H_{13}N_3O_3$
Syton Fast Yellow 3G [4106-76-7] B659-7796 $C_{16}H_{13}ClN_4O_4$
Syton Fast Yellow 5G [4106-67-6] B659-7812 $C_{16}H_{14}N_4O_4$
Syton Fast Yellow 10G [6486-23-3] B659-7928 $C_{16}H_{12}Cl_2N_4O_4$
Syton Fast Yellow G [2512-29-0] B659-8016 $C_{17}H_{16}N_4O_4$
Syton Pink B [12224-98-5] B659-8134
Syton Pink G [2768-89-0] B659-8241 $C_{24}H_{22}N_2O_3.ClH$
Syton Red 6B [1328-04-1] B659-8350
Syton Violet R [1325-82-2] B659-8464
Syton Yellow G [1326-11-0] B659-8589
Sytron [15708-41-5] B659-8607 $C_{10}H_{12}FeN_2O_8.Na$
Szklarniak [62-73-7] B659-8715 $C_4H_7Cl_2O_4P$
Sz NP [9003-56-9] B659-8824 $(C_2H_4.C_4H_6.C_3H_3N)_x$
Szomolnokite [14567-68-1] B659-8938 $Fe.H_2O_4S.H_2O$
T [26353-67-3] B659-9026 $(C_{16}H_8O_3S.CH_2O)_x$
T (dispersing agent) [26353-67-3] B659-9148 $(C_{16}H_8O_3S.CH_2O)_x$
T 1 [50-82-8] B659-9252 $C_7H_5Cl_3O_2$
T 1 [1067-33-0] B659-9361 $C_{12}H_{24}O_4Sn$
T 1 (catalyst) [1067-33-0] B659-9477 $C_{12}H_{24}O_4Sn$
T-2 [52-31-7] B659-9592 $C_7H_5Cl_3O_2$
T 2,4Kh [2569-01-9] B659-9611 $C_8H_6Cl_2O_3.C_6H_{15}NO_3$
T3 [6893-02-3] B659-9726 $C_{18}H_{12}I_3NO_4$
T 4 [11099-07-3] B659-9831
T4 [121-82-4] B659-9942 $C_3H_6N_6O_6$
T 5 [358-51-2] B660-0077 $C_{21}H_{26}ClN_2O_6S$
T 11 [13931-74-3] B660-0185 $C_{13}H_{12}O_2$
T 12 [77-58-7] B660-0219 $C_{32}H_{64}O_4Sn$
T 12 (catalyst) [77-58-7] B660-0326 $C_{32}H_{64}O_4Sn$
T 40 [7440-32-6] B660-0439 Ti
T 45 [9036-19-5] B660-0548 $(C_2H_4O)_nC_{14}H_{22}O$
T 60 [7440-32-6] B660-0653 Ti
T 72 [51-58-1] B660-0775 $C_8H_9N_3O_2.ClH$
T 100 [26471-62-5] B660-0885 $C_9H_{16}N_2O_2$
T-113 [126-22-7] B660-0991 $C_4H_{14}Cl_2O_4P$
T-148 [112-30-1] B660-1088 $C_{16}H_{32}O$
T160 [7440-32-6] B660-1196 Ti
T 403 [9046-10-0] B660-1212 $(C_2H_4O)_nC_6H_{16}N_2O$
T-428 [3811-46-9] B660-1331 $C_{12}H_{16}N_2O_3$
T 1384 [554-32-5] B660-1442 $C_{16}H_{28}N_{10}O_3$
T 1824 [314-13-6] B660-1557 $C_{34}H_{28}N_6O_{14}S_4.4Na$
T 2908 [9003-56-9] B660-1669 $(C_8H_8.C_4H_6.C_3H_3N)_x$
T 3303 [13931-64-1] B660-1781 $C_{10}H_{13}NO_2$
T 4500 [9003-56-9] B660-1804 $(C_8H_8.C_4H_6.C_3H_3N)_x$
T2A [51-24-1] B660-1919 $C_{14}H_8I_2O_4$
T-4CA [444-27-9] B660-2093 $C_4H_7NO_2S$
T 5B [9002-84-0] B660-2112 $(C_2F_4)_x$
T 8A [9002-84-0] B660-2228 $(C_2F_4)_x$
T 13P [7328-28-1] B660-2348 $C_9H_{15}Br_2Cl_3O_4P$
T 23P [126-72-7] B660-2452 $C_9H_{15}Br_6O_4P$
α-T [71-55-6] B660-2562 $C_2H_3Cl_3$
β-T [79-00-5] B660-2675 $C_2H_3Cl_3$
2,4,5-T [93-76-5] B660-2794 $C_8H_5Cl_3O_3$
2,4,6-T [575-89-3] B660-2813 $C_8H_5Cl_3O_3$
5MOT [608-07-1] B660-2927 $C_{11}H_{14}N_2O$
TA 1 [469-81-8] B660-3019 $C_{20}H_{30}N_2O_3$
TA 3 [9003-07-0] B660-3124 $(C_2H_6)_x$
TA 20 [6369-97-7] B660-3236 $C_8H_5Cl_3O_3.C_2H_7N$
TAA [62-55-5] B660-3352 C_2H_6NS
Tabalgin [103-90-2] B660-3469 $C_8H_9NO_2$
Tabatrex [141-03-7] B660-3571 $C_{12}H_{22}O_4$
Tabernanthin [83-94-3] B660-3682 $C_{20}H_{22}N_2O$
Tabernanthine [83-94-3] B660-3719 $C_{20}H_{22}N_2O$
Tabernanthine, monohydrochloride [5990-60-3] B660-3821 $C_{20}H_{22}N_2O.ClH$
Tabex [485-35-8] B660-3931 $C_{11}H_{14}N_2O$
Tabilin [113-96-4] B660-4025 $C_{16}H_{18}N_2O_4S.K$
Tablomyl [22457-89-2] B660-4135 $C_{18}H_{22}N_4O_4PS$
Tabloid [154-42-7] B660-4246 $C_8H_8N_2S$
Tabun [77-81-6] B660-4369 $C_5H_{11}N_2O_2P$
Tabutrex [141-03-7] B660-4472 $C_{12}H_{22}O_4$
TAC 121 [7705-07-9] B660-4583 Cl_3Ti
TAC 131 [7705-07-9] B660-4690 Cl_3Ti
Tacaryl [1229-35-2] B660-4715 $C_{16}H_{20}N_2S.ClH$
Tacaryl [1982-37-2] B660-4837 $C_{16}H_{20}N_2S$
Tacaryl hydrochloride [1229-35-2] B660-4943 $C_{16}H_{20}N_2S.ClH$
Tace [569-57-3] B660-5032 $C_{20}H_{21}ClO_2$
TACE [569-57-3] B660-5149 $C_{20}H_{21}ClO_2$
Tachmalin [4360-12-7] B660-5257 $C_{20}H_{22}N_2O_2$
Tachydrol [6416-03-1] B660-5372 $C_{20}H_{27}HgN_2O_6.xNa$
Tachysterol [115-61-7] B660-5488 $C_{28}H_{44}O$
Tachysterol, 3,5-dinitro-p-toluate [6024-60-8] B660-5591 $C_{36}H_{48}N_2O_8$
Tachysterol, dihydro- [67-96-9] B660-5613 $C_{28}H_{46}O$
Tachysterol2 [115-61-7] B660-5725 $C_{28}H_{44}O$
Tachysterol2, dihydro- [67-96-9] B660-5842 $C_{28}H_{46}O$
Tachysterol 4-methyl-3,5-dinitrobenzoate [6024-60-8] B660-5958 $C_{36}H_{48}N_2O_8$
Tachyatin [67-96-9] B660-6041 $C_{28}H_{46}O$
Tachystrin2 [115-61-7] B660-6152 $C_{28}H_{44}O$
Tacrine [321-64-2] B660-6261 $C_{13}H_{14}N_2$
Tactaran [113-59-7] B660-6386 $C_{18}H_{18}ClNS$
Taeniatol [97-23-4] B660-6405 $C_{13}H_{10}Cl_2O_2$
Taeniolin [300-08-3] B660-6511 $C_8H_{13}NO_2.BrH$
Tafapon [127-20-8] B660-6625 $C_3H_4Cl_2O_2.Na$
Tafasan [123-88-6] B660-6733 C_3H_7ClHgO
Tafasan 6W [123-88-6] B660-6855 C_3H_7ClHgO
Tafazine [122-34-9] B660-6966 $C_7H_{12}ClN_5$
Tafazine 50-W [122-34-9] B660-7057 $C_7H_{12}ClN_5$
Tag [62-38-4] B660-7165 $C_4H_8HgO_2$
Tag 331 [62-38-4] B660-7272 $C_4H_8HgO_2$
Tagat [9005-38-3] B660-7397
Tagathen [148-65-2] B660-7411 $C_{14}H_{18}ClN_3S$
Tagatose, D- [87-81-0] B660-7524 $C_6H_{12}O_6$
D-Tagatose [87-81-0] B660-7631 $C_6H_{12}O_6$
D-Tagatose phenylosazone [3879-35-4] B660-7741 $C_{18}H_{22}N_4O_4$
Tag Fungicide [62-38-4] B660-7868 $C_8H_8HgO_2$
Tag HL 331 [62-38-4] B660-7975 $C_8H_8HgO_2$
Taiguic acid [84-79-7] B660-8060 $C_{18}H_{14}O_3$
Taigu Wood [84-79-7] B660-8176 $C_{18}H_{14}O_3$
Taikarin F [10124-31-9] B660-8281 $H_3N.xH_2O_4P$
Tajmalin [4360-12-7] B660-8311 $C_{20}H_{22}N_2O_2$
Taka-amylase [9001-19-8] B660-8421
Taka-Diastase [9001-19-8] B660-8537
Taka-Diastase-A [9001-19-8] B660-8644
Takamina [51-43-4] B660-8756 $C_9H_{13}NO_3$
Takaoka Acid Fast Red 3B [6441-93-6] B660-8873 $C_{19}H_{17}N_3O_6S_2.2Na$
Takaoka Acid Orange II [633-96-5] B660-8986 $C_{16}H_{12}N_2O_4S.Na$
Takaoka Acid Red RS [3701-40-4] B660-9077 $C_{34}H_{28}N_4O_8S_2.2Na$
Takaoka Amaranth [915-67-3] B660-9181 $C_{20}H_{14}N_2O_{10}S_3.3Na$
Takaoka Brilliant Scarlet 3R [2611-82-7] B660-9291 $C_{20}H_{14}N_2O_{10}S_3.3Na$
Takaoka Direct Brown CB [3476-90-2] B660-9314 $C_{28}H_{22}N_6O_7S.2Na$
Takaoka Direct Orange R [2429-79-0] B660-9439 $C_{28}H_{21}N_5O_6S.2Na$
Takaoka Metanil Yellow [587-98-4] B660-9547 $C_{18}H_{15}N_3O_3S.Na$
Takaoka Rhodamine B [81-88-9] B660-9657 $C_{28}H_{31}N_2O_3.Cl$
Takathene [9002-88-4] B660-9762 $(C_2H_4)_x$
Takathene P 3 [9002-88-4] B660-9883 $(C_2H_4)_x$
Takathene P 12 [9002-88-4] B660-9906 $(C_2H_4)_x$
Takedo 1969-4-9 [9001-62-1] B661-0048
Takilon [9002-86-2] B661-0157 $(C_2H_3Cl)_x$
Takimetol [443-48-1] B661-0264 $C_6H_9N_3O_3$
Takineocol [67-63-0] B661-0387 C_3H_8O
Takycor [4360-12-7] B661-0407 $C_{20}H_{21}N_2O_2$
Taladren [58-54-8] B661-0518 $C_{13}H_{12}Cl_2O_4$
Talamo [57-43-2] B661-0626 $C_{11}H_{18}N_2O_3$
Talastine [16188-61-7] B661-0735 $C_{19}H_{21}N_3O$
Talasulfa [131-69-1] B661-0854 $C_{16}H_{14}N_2O_4S$
Talatrol [77-86-1] B661-0964 $C_4H_{11}NO_3$
Talbutal [115-44-6] B661-1059 $C_{11}H_{16}N_2O_3$
Talc [14807-96-6] B661-1163 $H_2O_3Si^3/_4Mg$
Talculin Z [557-05-1] B661-1278 $C_{18}H_{34}O_2.^1/_2Zn$
Talcum [14807-96-6] B661-1391 $H_2O_3Si.^3/_4Mg$
Talecid [131-69-1] B661-1411 $C_{16}H_{14}N_2O_4S$
Taleudron [85-73-4] B661-1526 $C_{17}H_{12}N_2O_4S_2$
Talicetimida [131-69-1] B661-1634 $C_{16}H_{14}N_2O_4S$
Talidine [85-73-4] B661-1740 $C_{17}H_{12}N_2O_4S_2$
Talimol [50-35-1] B661-1885 $C_{18}H_{10}N_2O_4$
Talimon [9014-38-4] B661-1972
Tallsol [*8002-26-4] B661-2066
Tall oil [*8002-26-4] B661-2173
Tall oil, acids, lead salts [*61788-54-3] B661-2287
Tall oil, 1-(2-hydroxyethyl)-2-imidazolin-2-ylnor [*61791-39-7] B661-2317
Tall oil, imidazoline deriv. [*61791-38-4] B661-2426
Tall oil, sulfated, sodium salt [*61790-35-0] B661-2534
Tall oil, sulfurized [*61790-36-1] B661-2643
Tall-oil soaps, limed and sulfurized [*61790-02-1] B661-2756
Tall-oil soaps, potassium [*61790-44-1] B661-2875
Tall-oil soaps, sodium [*61790-45-2] B661-2985
Tallol [*8002-26-4] B661-3075
Tallow [*61789-97-7] B661-3186
Tallow, amines, hydrogenated [*61789-79-5] B661-3299
Tallow, nitriles, hydrogenated [*61790-29-2] B661-3314
Tallow, sodium salt [*8052-48-0] B661-3430
Tallow, sulfated, sodium salt [*61790-30-5] B661-3543
Tallow alcohol [8005-44-5] B661-3658 $C_{16}H_{34}O.C_{18}H_{36}O$
Tallow benzyl dimethyl ammonium chloride [122-19-0] B661-3761 $C_{27}H_{50}N.Cl$
Talodex [55-38-9] B661-3882 $C_{14}H_{13}O_3I^2S_2$

Rosaniline acetate [6155-92-6] B535-8356 $C_{20}H_{19}N_3.xC_2H_4O_2$
Rosaniline Base [3248 93 9] B536-8478 $C_{20}H_{19}N_3$
Rosaniline chloride [632 99 5] B535-8587 $C_{20}H_{19}N_3.ClH$
Rosaniline hydrochloride [632 99-5] B535-8694 $C_{20}H_{19}N_3.ClH$
Rosanthrene Bordeaux 7GG [6420-39-9] B535-8715 $C_{32}H_{28}N_2O_8S_2.2Na$
Rosanthrene BX [6470-23-1] B535-8825 $C_{24}H_{20}N_4O_6S.Na$
Rosanthrene Fast Red 9BL [5979-31-7] B535-8941 $C_{29}H_{22}N_6O_8S_2.2Na$
Rosanthrene Fast Red BWL [6661-26-3] B535-9031 $C_{27}H_{27}N_7O_9S.2Na$
Rosanthrene Fast Red 7BLN [5938-85 2] B535-9146 $C_{29}H_{22}N_6O_8S_2.2Na$
Rosanthrene Fast Red Scarlet GL [6771-94-4] B535-9252 $C_{31}H_{23}N_5O_8S.2Na$
Rosanthrene Orange R [6391-21 5] B535-9364 $C_{33}H_{25}N_{11}O_7.2Na$
Rosanthrene Orange RNX [6391-21 5] B535-9485 $C_{33}H_{25}N_{11}O_7.2Na$
Rosanthrene Orange RS [6391-21-5] B535-9508 $C_{33}H_{25}N_{11}O_7.2Na$
Rosanthrene Orange RSS [6391-21-5] B535-9615 $C_{33}H_{25}N_{11}O_7.2Na$
Rosapin [114-43-2] B535-9727 $C_{24}H_{30}O_9$
Rosaramicin [35834-26-5] B535-9835 $C_{31}H_{51}NO_9$
Rosazurine B [6406-03-7] B535-9958 $C_{35}H_{30}N_6O_6S_2.2Na$
Rosazurine B [6416-64-4] B536-0007 $C_{36}H_{36}N_6O_6S_2.2Na$
Rosazurine G [6406-04-8] B536-0113 $C_{36}H_{32}N_6O_6S_2.2Na$
Rosazurin G [6406-02-6] B536-0225 $C_{34}H_{28}N_6O_6S_2.2Na$
Roscal [2470-73-7] B536-0334 $C_{24}H_{33}N_3O_8S$
Rose aniline [632-99-5] B536-0452 $C_{20}H_{19}N_3.ClH$
Rose Bengal [11121-48-5] B536-0569
Rose Bengal B [632-68-8] B536-0678 $C_{20}H_4Cl_4I_4O_5.2K$
Rose Bengale [11121-48-5] B536-0783
Rose Bengale B [632-68-8] B536-0813 $C_{20}H_4Cl_4I_4O_5.2K$
Rose Bengale DY [632 68-8] B536-0929 $C_{20}H_4Cl_4I_4O_5.2K$
Rose Bengale N [632 68-8] B536-1012 $C_{20}H_4Cl_4I_4O_5.2K$
Rose Bengal RB [632 68-8] B536-1128 $C_{20}H_4Cl_4I_4O_5.2K$
Rose Bengal sodium [632-69-9] B536-1237 $C_{20}H_4Cl_4I_4O_5.2Na$
Rose geranium oil Algerian [*8000-46-2] B536-1342
Roscine Cake [5844-12-2] B536-1463 $C_{20}H_{19}N_3.ClH.4H_2O$
Rosemide [51-31-9] B536-1573 $C_{12}H_{11}ClN_2O_5S$
Rosenstiehl Green [1344-43-0] B536-1689 MnO
Rosenstiehl's green [7787-35-1] B536-1799 $Ba.H_2MnO_4$
Roseothricin A [1405-22-7] B536-1814
Roseothricin B [1405-24-9] B536-1931
Roseothricin C [1405-23-8] B536-2029
Rose oxide [16409-43-1] B536-2132 $C_{10}H_{18}O$
Rosephenone [39347 18-7] B536-2355
Rosin [*8050-09-7] 3536-2589
Rosindamine [6837-70-3] B536-2690 $C_{23}H_{23}N_2O.Cl$
Rosin, disproportionated [*8050 09-7] B536 2710
Rosinduline 2G [1324-05-6] B536-2827 $C_{22}H_{14}N_2O_4S.Na$
Rosinduline G [1324-05-6] B536 2949 $C_{22}H_{14}N_2O_4S.Na$
Rosinduline GG [1324-05-6] B536-3031 $C_{22}H_{14}N_2O_4S.Na$
Rosin oil [*8002-16-2] B536-3143
Rosolic acid [603-45-2] B536-3258 $C_{19}H_{14}O_3$
p-Rosolic acid [603-45-2] B536-3365 $C_{19}H_{14}O_3$
Rosophenine 4B [6391-13-5] B536-3486 $C_{34}H_{28}N_6O_8S_2.2Na$
Rosophenine 10B [2150-33-6] B536-3505 $C_{24}H_{17}N_3O_7S_2.2Na$
Rosophenine 10B.FQ [2150-33-6] B536-3612 $C_{24}H_{17}N_3O_7S_2.2Na$
Rosophenine G [2150-33-6] B536-3728 $C_{24}H_{17}N_3O_7S_2.2Na$
Rosoxide [16409-43-1] B536-3839 $C_{10}H_{18}O$
Rospan [5836-10-2] B536-3951 $C_{17}H_{16}Cl_2O_3$
Rospin [5836-10-2] B536-4043 $C_{17}H_{16}Cl_2O_3$
Rospine [5836-10-2] B536-4159 $C_{17}H_{16}Cl_2O_3$
Rossite [15490-88-7] B536-4267 $Ce.4H_2O.2HO_3V$
Rotax [149-30-4] B536-4376 $C_7H_5NS_2$
Rotenon [83-79-4] B536-4498 $C_{23}H_{22}O_6$
Rotenone [83-79-4] B536-4511 $C_{23}H_{22}O_6$
(-)-Rotenone [83-79-4] B536-4627 $C_{23}H_{22}O_6$
5'β-Rotenone [83-79-4] B536-4734 $C_{23}H_{22}O_6$
Rotersept [55-56-1] B536-4845 $C_{22}H_{30}Cl_2N_{10}$
Rotocide [83-79-4] B536-4963 $C_{23}H_{22}O_6$
Rotoxamine [5660-77-0] B536-5051 $C_{16}H_{19}ClN_2O$
Rotoxamine tartrate [10089-42-6] B536-5164 $C_{16}H_{19}ClN_2O.xC_4H_6O_6$
Rottlerin [82-08-6] B536-5271 $C_{30}H_{28}O_8$
Rotundine [483-14-7] B536-5386 $C_{21}H_{25}NO_4$
Rotundine (Stephania), (-)- [483-14-7] B536-5414 $C_{21}H_{25}NO_4$
Rouge [1309-37-1] B536-5528 Fe_2O_3
Rouge (iron oxide) [1309-37-1] B536-5635 Fe_2O_3
Rouge Bordeaux B [5458-33-3] B536-5748 $C_{20}H_{14}N_2O_7S_2.2Na$
Rouge de Naples [1913-94-6] B536-5852 $C_8H_8N_8O_8.H_3N$
Rougexin [20830-75-5] B536-5971 $C_{41}H_{64}O_{14}$
Roulone [72-44-6] B536-6061 $C_{16}H_{14}N_2O$
Rouquinone [72-44-6] B536-6177 $C_{16}H_{14}N_2O$
Routrax [148 56 1] B536-6288 $C_8H_6F_3N_3O_4S_2$
Royalac 136 [19210-06-1] B536-6397 $H_8O_2PS_2.xZn$
Roxgamycin [8025 81 8] B536-6416
Roxan [299-84-3] B536-6535 $C_8H_8Cl_3O_3PS$
Roviciclina [60-54-8] B536-6647 $C_{22}H_{24}N_2O_8$
Rovocaine hydrochloride [550-83-4] B536-6756 $C_{16}H_{26}N_2O_3.ClH$
Rowalind [500 22-1] B536 6863 C_6H_5NO
Rowapraxin [18174 58 8] B536 6984 $C_{22}H_{25}NO_3.ClH$
Rowmate [1966-58-1] B536-7071 $C_9H_9Cl_2NO_2$
Roxanthin Red 10 [514-78-3] B536-7185 $C_{40}H_{52}O_2$
Roxarsone [121-19-7] B536-7295 $C_6H_6AsNO_6$
Roxilon [3625-07-8] B536-7314 $C_{42}H_{58}N_2O_9$
Roxinoid [50-55-5] B536-7427 $C_{33}H_{40}N_2O_9$
Roxion [60-51-5] B536-7542 $C_5H_{12}NO_3PS_2$
Roxomicina [3521-62-8] B536-7654 $C_{40}H_{71}NO_{14}.C_{12}H_{26}O_4S$
Roxoperone [2804-00-4] B536-7761 $C_{19}H_{23}FN_2O_3$
Roxosul tablets [127-69-5] B536-7876 $C_{11}H_{13}N_3O_3S$
Royalac 136 [19210-06-1] B536-7992 $H_8O_2PS_2.xZn$
Royal CBTS [95-33-0] B536-8085 $C_{13}H_{16}N_2S_2$
Royalite 20 [9003-56-9] B536-8104 $(C_8H_8.C_4H_6.C_3H_3N)_x$
Royal MBT [149-30-4] B536-8210 $C_7H_5NS_2$
Royal MBTS [120-78-5] B536-8328 $C_{14}H_8N_2S_4$
Royal Scarlet [5850-85-1] B536-8434 $C_{17}H_{14}N_2O_4S.^1/_2Ba$
Royal TMTD [137-26-8] B536-8556 $C_6H_{12}N_2S_4$
Royal White Light [471-34-1] B536-8664 $CH_2O_2.Ca$
Roylin [26000-17-9] B536-8776 $C_{28}H_{41}NO_7$
Royline [26000-17-9] B536-8883 $C_{28}H_{41}NO_7$
Rozenite [14567-70-5] B536-8914 $Fe.H_2O_4S.5H_2O$
Roztoczol [116-29-0] B536-9094 $C_{12}H_6Cl_4O_2S$
Roztoczol extra [116-29-0] B536-9117 $C_{12}H_6Cl_4O_2S$
Roztoczol fluid [80-33-1] B536-9222 $C_{12}H_8Cl_2O_2S$
R 5 P [4300-28-1] B536-9332 $C_8H_{11}O_8P$
RP 116 [515-59-3] B536-9440 $C_{10}H_{11}N_3O_2S_2$
RP 866 [130-42-7] B536-9569 $C_{22}H_{20}ClN_3O.ClH$
RP 902 [9003-35-4] B536-9679 $(C_8H_6O.CH_2O)_x$
RP 2145 [144 82-1] B536-9781 $C_9H_{10}N_4O_2S_2$
RP 2254 [80-34-2] B536-9890 $C_{11}H_{14}N_4O_2S_2$
RP 2255 [515-49-1] B536-9915 $C_7H_9N_3O_2S_2$
RP 2259 [535-65-9] B537-0063 $C_{12}H_{16}N_4O_2S_2$
RP 2275 [57 67-0] B537-0174 $C_7H_{10}N_4O_2S$
R.P. 2512 [140-64-7] B537-0282 $C_{19}H_{24}N_4O_2.2C_2H_6O_4S$
RP 2515 [659-40-5] B537-0393 $C_{20}H_{28}N_4O_2.2C_2H_6O_4S$
R.P. 2591 [536-29-8] B537-0416 $C_8H_8AsCl_2NO.ClH$
RP 2616 [68-35-9] B537-0533 $C_{10}H_{10}N_4O_2S$
RP 2632 [127-79-7] B537-0641 $C_{11}H_{12}N_4O_2S$
R.P. 2740 [493-78-7] B537-0751 $C_{15}H_{20}N_2S$
RP 2786 [91-84-9] B537-0864 $C_{17}H_{23}N_3O$
R.P. 2831 [543-15-7] B537-0985 $C_8H_{18}NO.ClH$
RP 2971 [531-08-8] B537-1072 $C_{15}H_{20}N_4$
RP 3015 [522-24-7] B537-1182 $C_{16}H_{18}N_2S$
RP 3038 [85-10-9] B537-1296 $C_{19}H_{28}ClN_3$
Rp 3203 [300-37-8] B537-1311 $C_7H_5I_2NO_3.C_4H_{11}NO_2$
RP 3276 [58-40-2] B537-1424 $C_{17}H_{20}N_2S$
RP 3277 [60-87-7] B537-1547 $C_{17}H_{20}N_2S$
RP 3356 [522-00-9] B537-1652 $C_{19}H_{24}N_2S$
RP 3602 [59-47 2] B537-1761 $C_{10}H_{14}O_3$
RP 3668 [133-65-3] B537-1871 $C_{20}H_{32}N_2O_{14}S_6.4Na$
RP 3697 [65 29-2] B537-1992 $C_{20}H_{60}N_3O_3.3I$
RP 3799 [90-89-1] B537-2087 $C_{10}H_{21}N_3O$
RP 3828 [58-37-7] B537-2101 $C_{19}H_{28}N_2S$
R.P. 4627 [117-65-7] B537-2217 $C_{18}H_{22}N_2S$
RP 4909 [84-01-5] B537-2324 $C_{19}H_{23}ClN_2S$
R.P. 5337 [8025-81-8] B537-2431
RP 6171 [1673-06-9] B537-2550 $C_{19}H_{20}N_2O_3$
R.P. 6484 [523-54-6] B537-2666 $C_{20}H_{26}N_2S$
RP 6753 [3639-19-8] B537-2771 $C_{14}H_{18}As_2N_2O_6$
RP 6870 [436-40-8] B537-2883 $C_{16}H_{22}N_2O_4$
RP 7044 [60-99-1] B537-2914 $C_{19}H_{24}N_2OS$
RP 7065 [13994-11-1] B537-3093 $C_{16}H_{22}N_2$
R.P. 7204 [3546-03-0] B537-3112 $C_{19}H_{21}N_3S$
RP 7293 [11006-76 1] B537-3221
RP 7360 [13764-35-7] B537-3333 $C_{19}H_{22}N_2S_2$
RP 7623 [117-89-5] B537-3444 $C_{21}H_{24}F_3N_3S$
RP 7746 [2622-37-9] B537-3563 $C_{19}H_{21}F_3N_2S$
RP 7843 [316-81-4] B537-3679 $C_{22}H_{20}N_4O_2S_2$
RP 7891 [1492-02-0] B537-3785 $C_9H_{18}N_2O_3S_2$
RP 8167 [563-12-2] B537-3894 $C_9H_{22}O_4P_2S_4$
RP 8532 [696 23-1] B537-3919 $C_4H_5N_3O_2$
RP 8599 [17116-40-7] B537-4016 $C_{19}H_{28}N_3O_2S_2.CH_4O_3S$
RP 8823 [443 48-1] B537-4124 $C_8H_9N_3O_3$
RP 8909 [2922 26-6] B537-4234 $C_{21}H_{23}N_3OS$
RP 8950 [3773-34-0] B537-4347 $C_{14}H_{16}ClN_3S$
R.P. 9153 [11053-35-1] B537-4455 $C_{20}H_{23}ClN_4OS$
RP 9159 [13093 88-4] B537-4572 $C_{22}H_{28}N_2O_2S$
RP 9895 [2275-23-2] B537-4682 $C_8H_{18}NO_4PS_2$
RP 9965 [14008-44-7] B537-4794 $C_{22}H_{27}N_3O_3S_2$
RP 10192 [127-33-3] B537-4816 $C_{21}H_{21}ClN_2O_6$
RP 11650 [3567-72-4] B537-4923 $C_8H_4Cl_2NO_2S$
RP 11670 [3567-79-1] B537 5017 $C_8H_4Cl_2NOS_2$
RP 11974 [2310-17-0] B537-5133 $C_{12}H_{15}ClNO_4PS_2$
RP 13057 [21830-81-3] B537-5241 $C_{27}H_{29}NO_{10}$
RP 13907 [2295-58-1] B537-5354 $C_8H_{10}O_4$
RP 16091 [13993-65-2] B537-5468 $C_{18}H_{13}NO_2S$
RP 16535 [4641-34-3] B537-5588 $C_{11}H_{12}N_2S.ClH$

APPENDIX 7

Pulp Chemicals Association

TALL OIL PRODUCTS • SULFATE TURPENTINE

60 EAST 42nd STREET, NEW YORK, N. Y. 10017 • 212 - 697 - 4816

Douglas E. Campbell • SECRETARY

August 17, 1977

GENERAL LETTER

TO THE MEMBER OF "TOSCA" OF
THE PULP CHEMICALS ASSOCIATION

Subject: Definitions of Tall Oil Products

Gentlemen;

As discussed at the July 28, 1977, meeting, I am enclosing two lists of definitions of tall oil products prepared by Dr. Arlt, Jr. of Arizona Chemical Company and Dr. Russell of Sylvachem Corporation. Please review and send your comments and/or revisions to this office prior to August 30. These lists will be discussed at the August 30 meeting in Washington.

If you have not already notified this office that you are coming to the August 30th meeting, call us immediately.

Sincerely yours,

Douglas E. Campbell
Secretary-Treasurer

DEC:maa
PCA 57.77
1.02,-.02

SPECIAL REPORT - PULP CHEMICALS ASSOCIATION
For the EPA in Compliance with the Toxic Substances Law

TURPENTINE

Any of the naturally occurring volatile predominately terpenic fractions or distillates obtained as a result of extraction of, gum collection from, or kraft pulping of softwoods. The major chemical components are the C10H16 terpene hydrocarbons: alpha-pinene, beta-pinene, limonene, -3-carene, and camphene. The minor components are other acyclic, monocyclic, or bicyclic terpenes, a variety of oxygenated terpenes, and anethole. The variable composition of turpentine depends primarily on the refining method, and the age, location, and species of the softwood source.

Definition designed to cover:
- a) gum, wood, and sulfate turpentine
- b) variation of composition
- c) crude or distilled turpentine
- d) natural origin

Definition (Reference):

TERPENES - as defined by Pulp Chemicals Association in Sulfate Turpentine Recovery, p 124.

ALPHA-PINENE

A distilled hydrocarbon fraction from turpentine containing greater than 90% alpha-pinene, the remainder being other terpene hydrocarbons.

BETE-PINENE

A distilled hydrocarbon fraction from turpentine containing greater than 70% beta-pinene with limonene, alpha-pinene camphene, and myrcene as the other major terpene hydrocarbons. The remaining minor components are acyclic, monocyclic and bicyclic terpenes.

PINE OIL

A volatile high-boiling distilled fraction consisting predominately of isomeric tertiary and secondary cyclic terpene alcohols with variable quantities of terpene hydrocarbons and ethers produced from the pinenes or from high-boiling turpentine residues. The exact composition varies with the turpentine source and production method.

Definition designed to cover:
- a) natural and synthetic pine oil
- b) variability
- c) distilled product

LIMONENE

A terpene fraction containing at least 90% limonene, the remainder being other terpene hydrocarbons and trace amounts of alcohols, ethers, aldehydes or ketones.

Definition designed to:
- a) cover high purity dipentenes produced by fractionation
- b) cover high purity dipentenes produced by isomerization of other terpene fractions
- c) cover dipentene fractions from citrus production
- d) distilled and undistilled products

DIPENTENE

A distilled fraction derived from turpentine containing at least 50% limonene with phellandrene, the terpinenes, terpinolene, and the cineoles as the other major components.

TERPINOLENE

A distilled hydrocarbon fraction containing at least 90% terpinolene, with the remainder being mixed terpene hydrocarbons.

TALL OIL 800-24-4

A complex combination of tall oil fatty acids and rosin containing at least 10% rosin. The balance of the product is neutral material.

TALL OIL SOAP SKIMMINGS 61790-45-2

Tall oil soap is the sodium salt of tall oil and is formed during the kraft pulping process where it becomes a component of the spent pulping liquor. The soap separates when the pulping liquor is concentrated and can be recovered by skimming the concentrated liquor.

SPENT ACID FROM TALL OIL SOAP ACIDULATION

Spent acid is the aqueous layer formed when tall oil soap is acidulated with sulfuric acid during the production of crude tall oil. This aqueous layer consists essentially of a solution of sodium sulfate and contains minor amounts of lignin and tall oil.

TALL OIL PITCH

The residue from the distillation of tall oil consisting of high boiling esters of fatty acids and rosin, neutral materials, and lesser amounts of free fatty acids and rosin acid.

TALL OIL HEADS

The low boiling fraction obtained on the distillation of crude tall oil. This product contains fatty acids such as palmitic, stearic, oleic and linoleic as well as neutral materials.

TALL OIL FATTY ACIDS 61790-12-3

A complex combination containing at least 90% fatty acids, primarily oleic and linoleic acids, obtained by the distillation of tall oil. The remainder of the product is rosin and neutral materials.

ROSIN 8050-09-7

A complex combinition consisting predominantly of resin acids or modified resin acids, such as dimers and decarboxylated resin acids, which has been derived from wood, especially pine wood. The balance of the material is neutral materials and fatty acids.

APPENDIX 8

September 7, 1977

Dr. George Semenuck
Environmental Protection Agency
401 "M" Street, S.W.
509 W. Tower
Washington, D.C. 20460

Dear Dr. Semenuck,

I want to first thank you on behalf of the Association and our Committee for meeting with us on August 30, 1977, at the Capital Hilton. It was a pleasure meeting with you, Dr. Gusman, and Dr. Mazza. We feel this was a most helpful session and it will expedite and facilitate compliance with the EPA regulations.

In accordance with our discussions we are submitting herewith a draft of the proposed definitions covering turpentine fractions and tall oil products. We would appreciate your review and comments.

Please call if there are any questions.

Sincerely yours,

Douglas E. Campbell
Secretary-Treasurer

DEC:maa
Enc.
cc: Dr. Arlt
Dr. Russell
Mr. Glenn
Mr. Weir
Executive Committee

SPECIAL REPORT - PULP CHEMICALS ASSOCIATION
For the EPA in Compliance with the Toxic Substances Law

TALL OIL 800-24-4

A complex combination of tall oil fatty acids and rosin containing at least 10% rosin. The balance of the product is neutral material.

TALL OIL SOAP SKIMMINGS 61790-45-2

Tall oil soap is the sodium salt of tall oil and is formed during the kraft pulping process where it becomes a component of the spent pulping liquor. The soap separates when the pulping liquor is concentrated and can be recovered by skimming the concentrated liquor.

SPENT ACID FROM TALL OIL SOAP ACIDULATION

Spent acid is the aqueous layer formed when tall oil soap is acidulated with sulfuric acid during the production of crude tall oil. This aqueous layer consists essentially of a solution of sodium sulfate and contains minor amounts of lignin and tall oil.

TALL OIL PITCH

The residue from the distillation of tall oil consisting of high boiling esters of fatty acids and rosin, neutral materials, and lesser amounts of free fatty acids and rosin acid.

TALL OIL HEADS

The low boiling fraction obtained on the distillation of crude tall oil. This product contains fatty acids such as palmitic, stearic, oleic and linoleic as well as neutral materials.

TALL OIL FATTY ACIDS 61790-12-3

A complex combination containing at least 90% fatty acids, primarily oleic and linoleic acids, obtained by the distillation of tall oil. The remainder of the product is rosin and neutral materials.

ROSIN 8050-09-7

A complex combinition consisting predominantly of resin acids or modified resin acids, such as dimers and decarboxylated resin acids, which has been derived from wood, especially pine wood. The balance of the material is neutral materials and fatty acids.

TURPENTINE

Any of the naturally occurring volatile predominately terpenic fractions or distillates obtained as a result of extraction of, gum collection from, or kraft pulping of softwoods. The major chemical components are the $C_{10}H_{16}$ terpene hydrocarbons: alpha-pinene, beta-pinene, limonene, -3-carene, and camphene. The minor components are other acyclic, monocyclic, or bicyclic terpenes, a variety of oxygenated terpenes, and anethole. The variable composition of turpentine depends primarily on the refining method, and the age, location, and species of the softwood source.

Definition designed to cover:
a) gum, wood, and sulfate turpentine
b) variation of composition
c) crude or distilled turpentine
d) natural origin

Definition (Reference):

TERPENES - as defined by Pulp Chemicals Association in Sulfate Turpentine Recovery, p 124.

ALPHA-PINENE

A distilled hydrocarbon fraction from turpentine containing greater than 90% alpha-pinene, the remainder being other terpene hydrocarbons.

BETA-PINENE

A distilled hydrocarbon fraction from turpentine containing greater than 70% beta-pinene with limonene, alpha-pinene camphene, and myrcene as the other major terpene hydrocarbons. The remaining minor components are acyclic, monocyclic and bicyclic terpenes.

PINE OIL

A volatile high-boiling distilled fraction consisting predominately of isomeric tertiary and secondary cyclic terpene alcohols with variable quantities of terpene hydrocarbons and ethers produced from the pinenes or from high-boiling turpentine residues. The exact composition varies with the turpentine source and production method.

Definition designed to cover:
a) natural and synthetic pine oil
b) variability
c) distilled product

LIMONENE

A terpene fraction containing at least 90% limonene, the remainder being other terpene hydrocarbons and trace amounts of alcohols, ethers, aldehydes or ketones.

Definition designed to:
a) cover high purity dipentenes produced by fractionation
b) cover high purity dipentenes produced by isomerization of other terpene fractions
c) cover dipentene fractions from citrus production
d) distilled and undistilled products

DIPENTENE

A distilled fraction derived from turpentine containing at least 50% limonene with phellandrene, the terpinenes, terpinolene, and the cineoles as the other major components.

TERPINOLENE

A distilled hydrocarbon fraction containing at least 90% terpinolene, with the remainder being mixed terpene hydrocarbons.

APPENDIX 9

Pulp Chemicals Association

TALL OIL PRODUCTS • SULFATE TURPENTINE

60 EAST 42nd STREET, NEW YORK, N. Y. 10017 • 212 - 697 - 4816

Douglas E. Campbell • SECRETARY

October 14, 1977

GENERAL LETTER

TO THE MEMBERS OF THE TECHNICAL
AND "TOSCA" COMMITTEES OF THE
PULP CHEMICALS ASSOCIATION

Subject: Definitions for the Candidate list

Gentlemen;

Per the request of Dr. H. G. Arlt, Jr., of Arizona, please discuss in your company for adequacy the following definitions and send your comments to Dr. Russell or Dr. Arlt, Jr., within the next one or two weeks.

DISPROPORTIONATED ROSIN: A stabilized rosin prepared by catalytic disproportioation of rosin whereby the abietic type acids content is substantially reduced with concomitant increases in the dehydro abietic and dihydroabietic acids content.

DIFINITION DESIGNED TO COVER: Disproportionated rosin prepared from rosin as defined earlier by the Pulp Chemicals Association.

ROSIN-GLYCEROL ESTERS: The ester prepared by reaction of rosin and glycerine until substantially all resin acids are esterified.

ROSIN-PENTAERYTHRITOL ESTERS: The ester prepared by reaction of rosin and pentaerythritol until substantially all resin acids are esterified.

TALL OIL FATTY ACIDS, SODIUM SOAP: The sodium salt of tall oil fatty acids.

TALL OIL FATTY ACIDS, POTASSIUM SOAP: The sodium salt of tall oil fatty acids.

Sincerely yours,

Douglas E. Campbell

Douglas E. Campbell
Secretary-Treasurer

HGA:DEC:maa
PCA 65.77
2.01 & "TOSCA" Committee

APPENDIX 10.

December 2, 1977

Dr. George Semeniuk
Environmental Protection Agency
401 "M" Street, S.W.
509 W. Tower
Washington, D.C. 20460

Dear Dr. Semeniuk,

Supplementing our letter of September 7, 1977, and referring to the letter of September 27, 1977, from Joan Urquhart, of your office, we are submitting additional proposed definitions covering other tall oil products. We would appreciate your review and comments.

Please call if there are any questions.

Several members of our group will be meeting with EPA representatives on December 13, 1977, in the morning. Should there be any questions, this would be a good opportunity to meet probably in the early afternoon.

Sincerely yours,

Douglas E. Campbell
Secretary-Treasurer

DEC:maa
Enc.
bc: Dr. Arlt
Dr. Russell
Mr. Glenn
Mr. Weir
Executive Committee
TOSCA Committee

SPECIAL REPORT - PULP CHEMICALS ASSOCIATION
For the EPA in Compliance with the Toxic Substances Law

DISPROPORTIONATED ROSIN:

A stabilized rosin prepared by catalytic disproportionation of rosin whereby the abietic type acids content is substantially reduced with concomitant increases in the dehydroabietic and dihydroabietic acids content.

DEFINITION DESIGNED TO COVER:

Disproportionated rosin prepared from rosin as defined earlier by the Pulp Chemicals Association.

ROSIN-GLYCEROL ESTERS:

The ester prepared by reaction of rosin, or modified rosin, with glycerine until substantially all acids are esterified.

ROSIN-PENTAERYTHRITOL ESTERS:

The ester prepared by reaction of rosin, or modified rosin, with pentaerythritol until substantially all acids are esterified.

DEFINITIONS DESIGNED TO COVER:

Rosin as defined before and modified rosins such as hydrogenated rosin, polymerized rosin, or rosin adducts of maleic- or fumaric acid.

TALL OIL FATTY ACIDS, SODIUM SOAP:

The sodium salt of tall oil fatty acids.

TALL OIL FATTY ACIDS, POTASSIUM SOAP:

The potassium salt of tall oil fatty acids.

1. TALL OIL (Apparent number from Candidate List: ~~800-24-4~~)

A complex combination of tall oil fatty acids and rosin containing at least 10% rosin. The balance of the product is neutral material.

2. TALL OIL SOAP SKIMMINGS (Apparent number from Candidate List: 61790-45-2

Tall oil soap is the sodium salt of tall oil and is formed during the kraft pulping process where it becomes a component of the spent pulping liquor. The soap separates when the pulping liquor is concentrated and can be recovered by skimming the concentrated liquor.

3. SPENT ACID FROM TALL OIL SOAP ACIDULATION

Spent acid is the aqueous layer formed when tall oil soap skimmings are acidulated with sulfuric acid during the production of crude tall oil. This aqueous layer consists essentially of a solution of sodium sulfate and contains minor amounts of lignin and tall oil.

4. TALL OIL PITCH

The residue from the distillation of tall oil consisting of high boiling esters of fatty acids and rosin, neutral materials, and lesser amounts of free fatty acids and rosin acid.

5. TALL OIL HEADS

The low boiling fraction obtained on the distillation of crude tall oil. This product contains fatty acids such as palmitic, stearic, oleic and linoleic as well as neutral materials.

6. TALL OIL FATTY ACIDS (Apparent number from Candidate List: 61790-12-3)

A complex combination containing at least 90% fatty acids, primarily oleic and linoleic acids, obtained by the distillation of tall oil. The remainder of the product is rosin and neutral materials.

7. ROSIN (Apparent number from Candidate List: 8050-09-7)

A complex combinition consisting predominantly of resin acids or modified resin acids, such as dimers and decarboxylated resin acids, which has been derived from wood, especially pine wood. The balance of the material is neutral materials and fatty acids.

Definition 7 designe
Definition 7 designed to cover:

a) Tall Oil Rosin
b) Wood Rosin
c) Gum Rosin

8. TURPENTINE 8006-64-2

Any of the naturally occurring volatile predominately terpenic fractions or distillates obtained as a result of extraction of, gum collection from, or kraft pulping of softwoods. The major chemical components are the C10H16 terpene hydrocarbons: alpha-pinene, beta-pinene, limonene, -3-carene, and camphene. The minor components are other acyclic, monocyclic, or bicyclic terpenes, a variety of oxygenated terpenes, and aliphatic alcohols. The variable composition of turpentine depends primarily on the refining method, and the age, location, and species of the softwood source.

Definition 8 designed to cover:

a) gum, wood, and sulfate turpentine
b) variation of composition
c) crude or distilled turpentine
d) natural origin

Definition (Reference):

TERPENES - as defined by Pulp Chemicals Association in Sulfate Turpentine Recovery, p 124.

9. ALPHA-PINENE

A distilled hydrocarbon fraction from turpentine containing greater than 80% alpha-pinene, the remainder being other terpene hydrocarbons.

10. BETA-PINENE

A distilled hydrocarbon fraction from turpentine or by isomerization of Alpha-pinene, containing greater than 70% beta-pinene with limonene, alpha-pinene camphene, and myrcene as the other major terpene hydrocarbons. The remaining minor components are acyclic, monocyclic and bicyclic terpenes.

11. PINE OIL

A volatile high-boiling distilled fraction consisting predominately of isomeric tertiary and secondary cyclic terpene alcohols with variable quantities of terpene hydrocarbons and ethers produced from the pinenes or from high-boiling turpentine residues. The exact composition varies with the turpentine source and production method.

Definition 11 designed to cover:

a) natural and synthetic pine oil
b) variability
c) distilled product

12. LIMONENE

A terpene fraction containing at least 80% limonene, the remainder being other terpene hydrocarbons and trace amounts of alcohols, ethers, aldehydes or ketones.

Definition 12 designed to:

a) cover high purity dipentenes produced by fractionation
b) cover high purity dipentenes produced by isomerization of other terpene fractions
c) cover dipentene fractions from citrus production
d) distilled and undistilled products

13. DIPENTENE

A distilled fraction derived from turpentine containing at least 50% limonene with phellandrene, the terpinenes, terpinolene, and the cineoles as the other major components.

I4. TERPINOLENE

A distilled hydrocarbon fraction containing at least 80% terpinolene, with the remainder being mixed terpene hydrocarbons.

15. DISPROPORTIONATED ROSIN:

A stabilized rosin prepared by catalytic disproportionation of rosin whereby the abietic type acids content is substantially reduced with concomitant increases in the dehydroabietic and dihydroabietic acids content.

Definition 15 designed to cover:

a) Disproportionated rosin prepared from rosin of definition 7.

16. ROSIN-GLYCEROL ESTERS:

The ester prepared by reaction of rosin, or modified rosin, with glycerine until substantially all acids are esterified.

17. ROSIN-PENTAERYTHRITOL ESTERS:

The ester prepared by reaction of rosin, or modified rosin, with pentaerythritol until substantially all acids are esterified.

Definitions 16 and 17 designed to cover:

a) Rosin as defined in 7 and modified rosins such as hydrogenated rosin, polymerized rosin, and rosin adducts of maleic- or fumaric acid.

18. TALL OIL FATTY ACIDS, SODIUM SOAP:

The sodium salt of tall oil fatty acids.

19. TALL OIL FATTY ACIDS, POTASSIUM SOAP:

The potassium salt of tall oil fatty acids.

APPENDIX 12.

TOXIC SUBSTANCES CONTROL ACT (TSCA)
PL 94-469

CANDIDATE LIST OF CHEMICAL SUBSTANCES

ADDENDUM III

CHEMICAL SUBSTANCES OF UNKNOWN OR VARIABLE COMPOSITION, COMPLEX REACTION PRODUCTS AND BIOLOGICAL MATERIALS

MARCH 1978

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF TOXIC SUBSTANCES
WASHINGTON, D.C. 20460

SECTION IV

WOOD AND PULP CHEMICALS

Developed in Conjunction
with the
Pulp Chemicals Association

Oil of Turpentine [*8006-64-2] H000-3119

Any of the volatile predominately terpenic fractions or distillates resulting from the solvent extraction of, gum collection from, or pulping of softwoods. Composed primarily of the $C_{10}H_{16}$ terpene hydrocarbons: α-pinene, β-pinene, limonene, 3-carene, camphene. May contain other acyclic, monocyclic, or bicyclic terpenes, oxygenated terpenes, and anethole. Exact composition varies with refining methods and the age, location, and species of the softwood source.

Oil of Turpentine, α-Pinene Fraction [*65996-96-5] H000-3234

The hydrocarbon fraction distilled from Oil of Turpentine. Contains greater than 80% α-pinene, the remainder being other terpene hydrocarbons.

Oil of Turpentine, β-Pinene Fraction [*65996-97-6] H000-3343

The hydrocarbon fraction distilled from Oil of Turpentine or produced by the isomerization of α-pinene. Contains greater than 70% β-pinene. Other major components being limonene, α-pinene, camphene, myrcene. May contain other acyclic, monocyclic, and bicyclic terpenes.

Pine Oil [*8002-09-3] H000-3459

A complex combination of terpenes produced by the high temperature distillation of oil of turpentine residues or by the catalytic hydration of pinenes. Composed primarily of isomeric tertiary and secondary cyclic terpene alcohols. May contain terpene hydrocarbons and ethers. Exact composition varies with production methods and turpentine source.

Terpenes, 80% or greater Limonene Fraction [*65996-98-7] H000-3568

A complex combination of terpenes derived from Oil of Turpentine or citrus oils by fractionation or isomerization of other terpene fractions. Contains at least 80% limonene, the remainder being other terpene hydrocarbons. May contain trace amounts of alcohols, ethers, aldehydes, or ketones.

Oil of Turpentine, 50% or greater Limonene Fraction [*65996-99-8] H000-36

A complex combination of terpenes derived from Oil of Turpentine. Contains at least 50% limonene, the remainder being phellandrenes, terpinenes, terpinolene, cineoles.

Oil of Turpentine, 80% or greater Terpinolene Fraction [*65997-00-4] H000-

A complex combination of terpenes derived from Oil of Turpentine. Contains at least 80% terpinolene, the remainder being mixed terpene hydrocarbons.

Tall Oil [*8002-26-4] H000-3818

A complex combination of tall oil rosin and fatty acids derived from the acidulation of crude tall oil soap and including that which is further refined. Contains at least 10% rosin.

Tall Oil, sodium salt [*65997-01-5] H000-3922

Synonyms: Black Liquor Soap, Tall Oil Soap Skimmings, Crude Tall Oil Soap (Kraft Process)

The sodium salt of Tall Oil formed during the kraft process where it becomes a component of the spent pulping liquor. The soap separates when the pulping liquor is concentrated and can be recovered by skimming the concentrated liquor.

Spent Acid from Crude Tall Oil Soap Acidulation [*65997-02-6] H000-4015

The aqueous layer formed by acidulation of tall oil soap with sulfuric acid during the production of Tall Oil. Composed primarily of a solution of sodium sulfate, the remainder being lignin and Tall Oil.

Tall Oil Pitch [8016-81-7] H000-4122

The residue from the distillation of Tall Oil. Composed primarily of high-boiling esters of fatty acids and rosin. May contain neutral materials, free fatty acids and rosin acids.

Tall Oil Heads [65997-03-7] H000-4246

The low boiling fraction obtained by the distillation of Tall Oil. Contains fatty acids such as palmitic, stearic, oleic and linoleic as well as neutral materials.

Tall Oil Fatty Acids [61790-12-3] H000-4352

A complex combination obtained by distillation of Tall Oil. Contains at least 90% fatty acids, primarily oleic and linoleic acids, the remainder being rosin and neutral materials.

Rosin [8050-09-7] H000-4463

A complex combination derived from wood, especially pine wood. Composed primarily of resin acids and modified resin acids such as dimers and decarboxylated resin acids. Includes rosin stabilized by catalytic disproportionation.

Tall Oil Fatty Acids, Sodium Salt [61790-45-2] H000-4577

Tall Oil Fatty Acids, Potassium Salt [61790-44-1] H000-4696

Rosin, Glycerol Ester [8050-31-5] H000-4713

Rosin, Pentaerythritol Ester [*8050-26-8] H000-4823

Rosin, Maleic Acid Adduct [*8050-28-0] H000-4931

Rosin, Fumaric Acid Adduct [*65997-04-8] H000-5028

Rosin, Polymerized [*65997-05-9] H000-5138

Rosin, Hydrogenated [*65997-06-0] H000-5258

Rosin, Reaction Product with Formaldehyde [*65997-07-1] H000-5367

Rosin, Maleic Acid Adduct - Glycerol Ester [*65997-08-2] H000-5477

Rosin, Maleic Acid Adduct - Pentaerythritol Ester [*65997-09-3] H000-5586

Rosin, Fumaric Acid Adduct - Glycerol Ester [*65997-10-6] H000-5615

Rosin, Fumaric Acid Adduct - Pentaerythritol Ester [*65997-11-7] H000-5724

Rosin, Polymerized - Glycerol Ester [*9006-47-7] H000-5831

Rosin, Polymerized - Pentaerythritol Ester [*65997-12-8] H000-5949

Rosin, Hydrogenated - Glycerol Ester [*65997-13-9] H000-6034

Rosin, Hydrogenated - Pentaerythritol Ester [*65997-14-0] H000-6149