

PETITION TO THE NATIONAL ORGANIC STANDARDS BOARD
For the Use of
SODIUM ACID PYROPHOSPHATE (SAPP)
In Produce

Item A:

This Petition supports the International Food Additives Council's (IFAC) request to amend the National List for "Nonagricultural (nonorganic) substances allowed in or on processed products labeled as 'organic' or made with organic (specified ingredients)" under Section 205.605(b). This Petition relates to Sodium Acid Pyrophosphate (SAPP) as described in the Food Chemicals Codex (FCC), as amended, including alternative nomenclature included therein, as described below. Currently, the National List under Section 205.605(b) provides for the use of SAPP, "for use only as a leavening agent." This Petition requests an additional use for this substance, namely as a sequestrant to maintain the appearance of cooked and uncooked fruits and vegetables.

Item B:

(1) COMMON NAME

Sodium Acid Pyrophosphate: (OTHER NAMES: Disodium Pyrophosphate; Disodium Dihydrogen Pyrophosphate; Acid Sodium Pyrophosphate; Disodium Diphosphate).

(2) CONTACT INFORMATION

This Petition is submitted by the International Food Additives Council (IFAC), an international association representing manufacturers and suppliers of high quality substances used worldwide as food ingredients. In particular, IFAC's Phosphates Committee is comprised of domestic and global suppliers of phosphates, used worldwide in food products. The information contained in this Petition was compiled using information provided by the IFAC Phosphates Committee members.

Contact Information:

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(3) INTENDED USE OF THE SUBSTANCE

As stated above, the purpose of this Petition is to add another use, in addition to leavening in baked goods, for this substance, namely as a sequestrant on cooked or uncooked produce to maintain the appearance and texture of these foods. Potato

processing provides the largest usage today in produce. Most research has been performed in the potato processing area.

Discoloration of potatoes is of three types:

- Chemical discoloration due to a reaction between copper, iron, manganese and other trace heavy metals and polyphenol compounds in the food. This creates dark pigments, of which the “after-cooking darkening” as a consequence of iron in potatoes, is typical.
- Non-enzymatic browning, often called the “Maillard” or “melanin” reaction. This is a slow reaction, requiring days to months, between amino groups of proteins and reducing sugars. It is accelerated by heat. Polymers analogous to urea formaldehyde plastics are observed.
- Enzymatic browning, which results from oxidation of naturally occurring precursors, catalyzed by an enzyme. It occurs in the presence of 1.0 ppm of iron or 0.1 ppm of copper, which is less than that present in most fruits and vegetables. Enzymatic browning reactions are rapid and occur from a matter of seconds to several hours.

Historically, discoloration has been controlled by blanching and/or treatment with sulfur dioxide, sulfites and bisulfites. Conventional blanching is immersion in hot water or steam for sufficient time to inactivate enzymes. Some fruits and vegetables soften, disintegrate or suffer other damage when subjected to blanching, which is effective only against enzymatic browning.

Sulfur dioxide compounds have also been widely used to offset these problems and are still relied upon, to some extent, for blocking non-enzymatic and enzymatic browning. Though generally efficient, some individuals are highly allergic to sulfur compounds and the FDA has restricted their use.

In recent years, phosphates have proven their value in supplementing or replacing the sulfur dioxide derivatives, sodium sulfite and bisulfite, in non-enzymatic applications to prevent discoloration in fruits and vegetables.

Chemical discoloration such as the “aftercooking darkening,” which originates from naturally present or equipment iron, is effectually controlled in white potatoes, for instance, by the use of SAPP so that the natural white color of the potato is maintained. SAPP not only inhibits “after-cooking darkening” but also eliminates previously formed discolorations of this type. Its strong sequestering properties prevent the iron complex from forming a dark pigment.

Discoloration or darkening is also a serious problem with processed sweet potatoes. As in white potatoes, iron plays a role in causing after-cooking darkening. The color of sweet potatoes can be stabilized by the sequestration capability of SAPP. Research by Deobald

et al. has also shown that SAPP, alone and in combination with certain other ingredients, can prevent oxidative development of off-flavors in sweet potatoes.

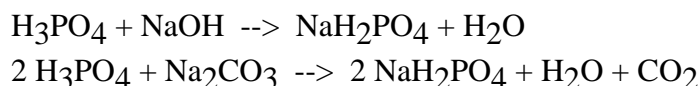
Other vegetables and fruits have also been found to benefit by treatment with SAPP, either alone (Gogins, K. and Smith, D.) or in blends with other food ingredients (Beck, R.G.). Reported work has been done on produce such as cauliflower, lettuce, tomatoes, peppers, and apples. These produce treatments have been found not only to prevent discoloration, but also to stabilize the texture and taste of produce compared to untreated produce (Molins, R.A.).

Because of the importance of the use of SAPP in the conventional food market as a sequestrant to maintain the appearance and texture of produce, the organic market could benefit tremendously if this use of SAPP is allowed on the National List.

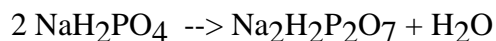
(4) Need info here on list of crop, livestock or handling activities for which the substance will be used. N/A

(5) SOURCE OF SUBSTANCE/DESCRIPTION OF MANUFACTURING PROCESS

Sodium acid pyrophosphate ($\text{Na}_2\text{H}_2\text{P}_2\text{O}_7$) is prepared by partial neutralization of phosphoric acid with sodium hydroxide or sodium carbonate to form monosodium phosphate:



This step is followed by molecular dehydration of monosodium phosphate under controlled conditions at approximately 250°C to form SAPP:



SAPP is then milled to a powder and packaged under Good Manufacturing Practice following HACCP plans. Testing of the final product is done in accordance with the Food Chemicals Codex (FCC) monograph specifications.

(6) Need information on reviews by State or private certification programs of SAPP.
N/A

(7) REGULATORY STATUS

Sodium Acid Pyrophosphate is a multiple purpose substance deemed by FDA to be Generally Recognized As Safe (GRAS) under 21 CFR 182.1087 when used in accordance with good manufacturing practice. The safety of this substance was reviewed by the Select Committee on GRAS Substances (SCOGS) and assigned a Category 1 Recommendation, namely that the phosphates are safe "... when they are used at levels that are now current or might reasonably be expected in the future."

SAPP is a common food additive with FDA and USDA approved uses for many other technical functions in foods. These include:

- Use as a sequestrant, for example to sequester iron during the processing of potatoes to prevent a gray discoloration from occurring
- Use as a leavening agent in bakery goods
- Use as an emulsifying agent in process cheese applications
- Use in canned tuna as an inhibitor of the formation of struvite crystals
- Use as a curing accelerator in certain processed meats to accelerate color fixing or preserve color during storage
- Use in meat and poultry products to decrease the amount of cooked out juices
- Use as a hog carcass scald agent to remove hair
- Use as a poultry carcass defeathering agent
- Use as a sequestrant in potable water treatment (approved by the National Sanitation Foundation, NSF)

The citation for the FDA regulation for SAPP is provided above. There are no EPA or state registration numbers for SAPP nor are any required.

(8) The Chemical Abstract Service (CAS) number or other product numbers

For sodium acid pyrophosphate:

- CAS # 7758-16-9
- International Number System (INS) Number: 450(i)
- EINECS # 231-835-0

Monographs stating specifications for purity and safety considerations for use of SAPP in food products are published in various compendia, including:

- Food Chemicals Codex (FCC), prepared by the Council of Experts, published by the Board of Trustees, US Pharmacopeial Convention
- Joint FAO/WHO Expert Committee on Food Additives (JECFA), a joint effort of the Food and Agriculture Organization of the U.N. and the World Health Organization
- European Commission's Directive 96/77/EC, specifications for food additives, & update 82/02/EC in October 2002
- Japan's Specifications and Standards for Food Additives (JSFA), of the Ministry of Health and Welfare of Japan

(9) PHYSICAL PROPERTIES AND CHEMICAL MODE OF ACTION

Molecular formula: $\text{Na}_2\text{H}_2\text{P}_2\text{O}_7$
Molecular weight: 221.9

Sodium acid pyrophosphate is a white, crystalline powder with no odor. The melting point is about 600°C. The pH of a 1% solution of SAPP in water is about

4. SAPP is soluble in water at the following levels:

5.0 (g/100 g H₂O) @ 0°C
12.5 (g/100 g H₂O) @ 25°C
20.0 (g/100 g H₂O) @ 50°C

SAPP is not considered a hazardous material for transportation or disposal purposes. If exposed to the environment, SAPP would eventually hydrolyze to sodium orthophosphates, which are also approved food additives (both in the FCC and on the NOP National List). Additional toxicological information is presented in the Material Safety Data Sheets (MSDS), which is being sent with this document.

(10) The attached Material Safety Data Sheets (MSDS) for sodium acid pyrophosphate (SAPP) provide the requested safety information.

(11) REFERENCES:

Beck, R.G., U.S. Patent # 5389389 – Compositions and methods for inhibiting browning of processed produce, Issue Date: Feb. 14, 1995.

Branen, A.L., Davidson, P.M., Salminen, S., and Thorngate III, J.H., 2002 (eds.) Food Additives (2nd ed.) New York: Marcel Dekker.

Deobald, H.J., McLemore, T.A., Bertoniere, N.R., and Martinez, J.A., Food Technology, 18, 1970, 1964.

Demam, J.M. and Melnychyn, P. 1971. Symposium: Phosphates in Food Processing. The Avi Publishing Company, Inc.

European Commission. A “Toolbox” for the Reduction of Acrylamide in Fried Potato Products/French Fries:

<http://ec.europa.eu/food/food/chemicalsafety/contaminants/acrylamide/frenchfries-EN-final.pdf>

Ellinger, R.H. 1972. Phosphates in food processing, in T.E. Furia (ed.), CRC Handbook of Food Additives (2nd ed.): 617-780. Cleveland, OH: CRC Press.

Ellinger, R.H., 1972. Phosphates as Food Ingredients, 85-88. Cleveland, OH: CRC Press.

Gard, D.R. 1996. Phosphoric acids and phosphates, in J.I. Kroschwitz (ed.), Kirk-Othmer Encyclopedia of Chemical Technology, (4th ed.) 18: 669-718. New York: John Wiley & Sons.

Gogins, K.A.Z., Smith, D., U.S. Patent # 4647462 – Frozen cauliflower product and treatment method, Issue Date: March 3, 1987.

ICL Application Sheet. www.icl-perfproductslp.com/mm/files/ICL_Food_Phosphates_Other_Applications.pdf

Innophos Application Sheet. <http://www.innophos.com/pdf/Taterfos%20ADS.pdf>

Lindsay, R.C. 1985. Food Additives. Chapter in: Food Chemistry Ed. O.R. Fennema. Marcel Dekker, Inc.

Molins, R.A., 1991. Phosphates in Food, 185 – 192. Boca Raton, FL: CRC Press.

Van Wazer, J.R. 1961. Food and Dentrifice Applications. Chapter in: Phosphorus and its Compounds. Volume II. Interscience Publishers Inc.

Wang-Pruski, Gefu, Nowak, Jerzy. Jan/Feb 2004. American Journal of Potato Research, Jan/Feb 2004. Potato After-Cooking Darkening. Web access to the relevant section at: http://findarticles.com/p/articles/mi_qa4069/is_200401/ai_n9402757/pg_7

(12) PETITION JUSTIFICATION STATEMENT:

As stated above, this petition requests that an additional use be specified for this substance on produce, which facilitates the use of these products without changing the basic characteristics of these products.

SAPP is widely recognized and approved as a food ingredient in the international community. The countries or communities that have specific approvals for use of SAPP in foods include:

- The United States of America (FDA, & USDA)
- The Canadian Dept. of Justice (Food & Drugs Act)
- The European Commission (European Food Safety Authority)
- The Ministry of Health and Welfare of Japan
- The Food Standards of Australia and New Zealand
- The United Nations' World Health Organization and Food and Agriculture Organization (JECFA - Joint FAO/WHO Expert Committee on Food Additives)

Because of the importance of the use of SAPP in the conventional food market as a sequestrant to maintain the appearance and texture of produce, the organic market could benefit tremendously if this use of SAPP is allowed on the National List.

6/22/09



**ICL Performance
Products LP**

Material Safety Data Sheet

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Identification

Product Name: SODIUM ACID PYROPHOSPHATE
Reference Number: AST10051
Date: March 12, 2007
Synonyms: SAPP; Pyrophosphate Acid, Disodium Salt; Disodium Dihydrogen Pyrophosphate

Use of substance or preparation

Food ingredient, buffer, sequesterant, deflocculate, peptizing agent in cheese and meat products, dairy cleaners, drilling mud, metal cleaning and phosphatizing.

Company/Undertaking Identification

ICL PERFORMANCE PRODUCTS LP
622 Emerson Road - Suite 500
St. Louis, Missouri 63141

Emergency telephone: In USA call CHEMTREC: 1-800-424-9300
In Canada call CANUTEC: 1-613-996-6666

General Information: 1-800-244-6169 (Worldwide)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Composition

<u>Substance</u>	<u>CAS No.</u>	<u>EINECS No</u>	<u>%w/w</u>	<u>Risk Phrase</u>
Sodium Acid Pyrophosphate	7758-16-9	231-835-0	95+	None

3. HAZARDS IDENTIFICATION

Classification of the substance/preparation

EC Classification None
Safety phrase None

Human Health Effects

The product may cause eye and respiratory tract irritation. May cause skin irritation.

Environmental Effects

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This material is not expected to produce any significant environmental effects when recommended use instructions are followed. May cause temporary algal bloom.

4. FIRST-AID MEASURES

WARNING!

CAUSES EYE AND RESPIRATORY TRACT IRRITATION, MAY CAUSE SKIN IRRITATION

General

Treatment is symptomatic and supportive. This product may cause eye, skin, and respiratory tract irritation. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause mild skin irritation with symptoms including redness and burning. Can cause eye irritation with symptoms including stinging, tearing, redness and swelling. Inhalation of this dust may cause coughing, chest pain, runny nose and burning throat.

Eye contact

Rinse immediately with plenty of water. If easy to do, remove any contact lenses. Get medical attention if irritation occurs and persists. Remove contaminated clothing. Remove material from eyes, skin and clothing. Wash clothing before reuse.

Skin contact

Remove this material with plenty of soap and water. Contact with the dry material may cause drying, or chapping, redness or burning of the skin.

Inhalation

Remove to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Inhalation of the dust may cause coughing and sneezing.

Ingestion

If swallowed, do NOT induce vomiting. Rinse mouth with plenty of water and get medical attention. Contact a Poison Control Center. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Extinguishing media

Non-combustible. No special requirement.

Unsuitable extinguishing media

Non-combustible. No special requirement.

Exposure hazards

No special considerations.

Protective equipment

As a general precaution, firefighters, and others exposed, wear self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

No special requirement.

Environmental precautions

Small quantities: Presents no environmental problems.

Large quantities: As general precaution, avoid discharge into the environment.

Methods for cleaning up

Sweep, scoop or vacuum and place into containers for disposal. Flush area with water.

Refer to Section 13 for disposal information and Sections 14 and 15 for reportable quantity information.

7. HANDLING AND STORAGE

Handling

Avoid breathing dust.

Keep container closed.

Use only with adequate ventilation.

Avoid contact with eyes and skin.

Wash thoroughly after handling.

Do not taste or swallow.

Engineering measures

Provide natural or mechanical ventilation to minimize exposure. The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment. Consult National Fire Protection Association (NFPA) Standard 91 for design of exhaust systems.

Storage

Store in a cool, dry place to maintain product performance. Emptied container retains product residue. Observe all labeled safeguards until container is cleaned, reconditioned, or destroyed. The reuse of this material's container for non-industrial purposes is prohibited and any reuse must be in consideration of the data provided in this MSDS.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure limit

OSHA and ACGIH have not established specific exposure limits for this material. However, OSHA and ACGIH have established limits for particulates not otherwise regulated (PNOR) and particulates not otherwise classified (PNOC) which are the least stringent exposure limits applicable to dusts.

ACGIH TLV 10 mg/m³ (inhalable) 8-hr TWA, 3 mg/m³ (respirable) 8-hr TWA
OSHA PEL 15 mg/m³ (total dust) 8-hr TWA, 5 mg/m³ (respirable) 8-hr TWA

Components referred to herein may be regulated by specific Canadian provincial legislation. Please refer to exposure limits legislated for the province in which the substance will be used.

Respiratory protection

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Avoid breathing dust. In case of insufficient ventilation, wear suitable respiratory equipment. Use NIOSH/MSHA approved respiratory protection equipment when airborne exposure limits are exceeded. Consult the respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Use approved respiratory protective equipment as described in the U.S. OSHA 29 CFR 1910.134 or European Standard EN149.

Hand/skin protection

Wearing protective clothes is recommended; wash hand and contaminated skin thoroughly after handling.

Eye protection

Wear appropriate protective eyeglasses or chemical safety goggles as described in the U.S. OSHA 29 CFR 1910.133 or European Standard EN 166.

9. PHYSICAL AND CHEMICAL PROPERTIES

General Information

Chemical Formula:	Na ₂ H ₂ P ₂ O ₇
Form	Powder, free flowing
Color	White
Odor	Odorless

Important health, safety and environmental information

pH (1% solution)	4.0 – 5.0
Melting point:	Decomposes between 250 – 275 °C (482-527 °F) to polyphosphates, which melt between 600 - 650 °C (1112-1202 °F)
Bulk density:	0.8 – 1.33 g/cc
Water solubility (g/100g H ₂ O):	5 @ 0 °C 12.5 @ 25 °C 20 @ 50 °C 65 @ 75 °C

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

Product is stable under normal conditions of storage and handling.

Conditions to avoid

None known.

Materials to avoid

Strong mineral acids

Hazardous decomposition products

None known.

11. TOXICOLOGICAL INFORMATION

The dry powder may cause foreign body irritation in some individuals. Prolonged contact with the dry powder may cause drying or chapping of the skin. Workers exposed to dust of this product reported moderate irritation of the nose and throat, with five of the eighteen workers reporting nasal stuffiness and nosebleeds. High dust concentrations were reported to cause mild eye and skin irritation.

Laboratory data

Data from ICL Performance Products LP single-dose (acute) animal studies with this material are given below:

Oral - rat LD50 -	3,600 mg/kg; slightly toxic
Dermal - rabbit LD50:	> 7,940 mg/kg; practically non-toxic
Eye Irritation - rabbit:	66.5/110; severely irritating
Skin Irritation - rabbit:	0.7/8.0; slightly irritating
Inhalation - LC50	>0.58 mg/l, 4 hr (rat) - maximum attainable concentration

No birth defects were reported in mice, hamsters, or rabbits given sodium acid pyrophosphate during pregnancy. No adverse genetic effects were reported in standard tests using animals or bacterial and yeast cells.

12. ECOLOGICAL INFORMATION

Environmental Toxicity

ICL Performance Products LP has not conducted environmental toxicity studies with this product.

Environmental Fate

Inorganic compounds in contact with the soil, sub-surface or surface waters may be taken up by plants and utilized as essential nutrients. Phosphates may also form precipitates, usually with calcium or magnesium. The resultant compounds are insoluble in water and become a part of the soil or sediment. The term biodegradability, as such, is not applicable to inorganic compounds.

13. DISPOSAL CONSIDERATIONS

European waste catalog number

The data provided in this section is for information only. Please apply the appropriate classification for your waste.

06 03 07 Waste from inorganic chemical processes, waste salts and their solutions, phosphates and related solid salts

Disposal Considerations

This material when discarded is not a hazardous waste as that term is defined by the U.S. Resource, Conservation and Recovery Act (RCRA), 40 CFR 261. Dry material may be land filled or recycled in accordance with local, state and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

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Road/Rail, Sea and Air

IMDG/UN	Not regulated for transport
ICAO/IATA	Not regulated for transport
RID/ADR	Not regulated for transport
Canadian TDG	Not regulated for transport
U.S. DOT	Not regulated for transport

15. REGULATORY INFORMATION**EC label**

None

Chemical Inventory

USA TSCA:	Listed
Canada DSL:	Listed
EC:	Listed

Additional information

WHMIS Classification: D2 (B) – Materials Causing Other Toxic Effects

SARA Hazard Notification

Hazard Categories Under Title III Rules (40 CFR 370):	Immediate
Section 302 Extremely Hazardous Substances:	None
Section 313 Toxic Chemical(s):	None

CERCLA Reportable Quantity: Not applicable

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation and the MSDS contains all the information required by the Canadian Controlled Products Regulation.

Refer to Section 11 for OSHA/HPA Hazardous Chemical(s) and Section 13 for RCRA classification.

16. OTHER INFORMATION

	<u>Health</u>	<u>Fire</u>	<u>Reactivit</u>	<u>Additional Information</u>
Suggested NFPA Rating	2	0	$\frac{Y}{0}$	
Suggested HMIS Rating	2	0	0	J J = Splash goggles, gloves, synthetic apron, dust & vapor respirator

Reason for revision: Revised section 9. Supersedes MSDS dated: March 6, 2007
Drafted in accordance with ECC Dir 2001/58/EC

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Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, ICL Performance Products LP makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will ICL Performance Products LP be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS

AST10051.4020.doc



Material Safety Data Sheet

TATERFOS

Date Prepared: 8/22/07

Supersedes Date: 8/13/04

1. PRODUCT AND COMPANY DESCRIPTION

Innophos
PO Box 8000
259 Prospect Plains Road
Cranbury NJ 08512-8000

Emergency Phone Numbers:

FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT:
CANUTEC at 613-996-6666 (call collect) or INNOPHOS ECT (Emergency Communication Team) at
615-386-7816.

For Product Information:

(609) 495-2495

Product Status:

FDA regulated use only.

Product Use:

Chemical Name or Synonym:

DISODIUM PYROPHOSPHATE

Molecular Formula:

$\text{Na}_2\text{H}_2\text{P}_2\text{O}_7$

Prepared By:

Innophos Regulatory Department, (609) 495-2495.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Reg Number	WHMIS Hazard	Percentage
SODIUM ACID PYROPHOSPHATE	7758-16-9	Y	100

3. HAZARDS IDENTIFICATION

A. EMERGENCY OVERVIEW:

Physical Appearance and Odor:

white crystalline or powder solid, odorless.

Warning Statements:

WARNING!! CAUSES SKIN AND EYE IRRITATION. MAY CAUSE RESPIRATORY TRACT IRRITATION.

B. POTENTIAL HEALTH EFFECTS:

Acute Eye:

Irritant. Can cause redness, irritation, tissue destruction, on prolonged contact.

Acute Skin:

Low acute dermal toxicity. Slightly irritating. May cause redness, irritation.

Acute Inhalation:

Low acute inhalation toxicity. Dusts may cause upper respiratory tract irritation.

Acute Ingestion:

Low acute oral toxicity. May cause nausea, vomiting, diarrhea.

Chronic Effects:

This product does not contain any ingredient designated by IARC, NTP, ACGIH or OSHA as probable or suspected human carcinogens.

4. FIRST AID MEASURES

FIRST AID MEASURES FOR ACCIDENTAL:

Eye Exposure:

Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Seek medical attention if irritation develops or persists or if visual changes occur.

Skin Exposure:

In case of contact, immediately wash with plenty of soap and water for at least 5 minutes. Seek medical attention if irritation develops or persists. Remove contaminated clothing and shoes. Clean contaminated clothing and shoes before re-use.

Inhalation:

If respiratory irritation or distress occurs remove victim to fresh air. Seek medical attention if respiratory irritation or distress continues.

Ingestion:

Do not induce vomiting unless instructed to do so by a physician. If victim is conscious and alert, give 1-2 glasses of water to drink. Do not give anything by mouth to an unconscious person. Seek medical attention. Do not leave victim unattended.

MEDICAL CONDITIONS POSSIBLY AGGRAVATED BY EXPOSURE:

Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

NOTES TO PHYSICIAN:

All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Ingestion of large quantities of phosphate salts (over 1.0 grams for an adult) may cause an osmotic catharsis resulting in diarrhea and probable abdominal cramps. Larger doses such as 4-8 grams will almost certainly cause these effects in everyone. In healthy individuals most of the ingested salt will be excreted in the feces with the diarrhea and, thus, not cause any systemic toxicity. Doses greater than 10 grams hypothetically may cause systemic toxicity. Treatment should take into consideration both anionic and cation portion of the molecule. The following treatments should be considered for the specific group(s) of phosphate salts found in this product:

--All phosphate salts, except calcium salts, have a hypothetical risk of hypocalcemia, so calcium levels should be monitored.

--Ammonium salts have a hypothetical risk of ammonia toxicity. In addition to calcium levels, ammonia and phosphate levels should be monitored.

--Potassium salts have a hypothetical risk of hyperkalemia which can cause cardiac arrhythmia. In addition to calcium levels, potassium and phosphate levels should be monitored. Also consider continuous EKG monitoring to detect hyperkalemia.

--Sodium salts have a hypothetical risk of hypernatremia. In addition to calcium levels, sodium and phosphate levels should be monitored.

5. FIRE FIGHTING MEASURES

FIRE HAZARD DATA:**Flash Point:**

Not Applicable

Extinguishing Media:

Not combustible. Use extinguishing method suitable for surrounding fire.

Special Fire Fighting Procedures:

Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.

Unusual Fire and Explosion Hazards:

Not combustible. Like all organic and most dry chemicals, as a powder or dust, this product (when mixed with air in critical proportions and in the presence of an ignition source) may present an explosion hazard.

Hazardous Decomposition Materials (Under Fire Conditions):

oxides of phosphorus

6. ACCIDENTAL RELEASE MEASURES

Evacuation Procedures and Safety:

Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.

Containment of Spill:

Dike or retain dilution water or water from firefighting for later disposal. Follow procedure described below under Cleanup and Disposal of Spill.

Cleanup and Disposal of Spill:

Sweep or vacuum up and place in an appropriate closed container (see Section 7: Handling and Storage). Avoid creation of dusty conditions. Clean up residual material by washing area with water and detergent. Decontaminate tools and equipment following cleanup.

Environmental and Regulatory Reporting:

Do not flush to drain. Runoff from fire control or dilution water may cause pollution. Prevent material from entering public sewer system or any waterways. Large spills should be handled according to a predetermined plan. For assistance in developing a plan contact the Technical Service Department using the Product Information phone number in Section 1.

7. HANDLING AND STORAGE

Minimum/Maximum Storage Temperatures:

Not Available

Handling:

Avoid breathing dusts. Avoid direct or prolonged contact with skin and eyes.

Storage:

This product is a food ingredient. Store in tightly closed containers. Store in an area that is cool, dry, away from ignition sources, away from incompatible materials (see Section 10. Stability and Reactivity), isolated from all toxic and harmful substances, This product is hygroscopic and tends to cake on storage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Introductory Remarks:

These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. While developing safe handling procedures, do not overlook the need to clean equipment and piping systems for maintenance and repairs. Waste resulting from these procedures should be handled in accordance with Section 13: Disposal Considerations.

Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

Exposure Guidelines:

No exposure limits were found for this product or any of its ingredients.

Engineering Controls:

Where engineering controls are indicated by use conditions or a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures: general area dilution/exhaust ventilation.

Respiratory Protection:

When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.

Under normal conditions, in the absence of other airborne contaminants, the following devices should provide protection from this material up to the conditions specified by the appropriate OSHA, WHMIS or ANSI standard(s): dust/mist filtering respirator.

Eye/Face Protection:

Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the

particular use intended for this material.

It is generally regarded as good practice to wear a minimum of safety glasses with side shields when working in industrial environments.

Skin Protection:

Skin contact should be minimized through use of gloves and suitable long-sleeved clothing (i.e., shirts and pants). Consideration must be given both to durability as well as permeation resistance.

Work Practice Controls:

Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material:

- (1) Do not use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
- (2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
- (3) Wash exposed skin promptly to remove accidental splashes or contact with this material.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product Information phone number in Section 1 for its exact specifications.

Physical Appearance:

white crystalline or powder solid.

Odor:

odorless.

pH:

3.8 to 4.5 at 1 wt/wt%.

Specific Gravity:

Not Available

Density:

0.61 g/ml at 25 C (77 F).

Water Solubility:

soluble

Melting Point Range:

> 900 C (1652 F)

Boiling Point Range:

Not Available

Vapor Pressure:

Not Available

Vapor Density:

Not Available

Molecular Weight:

222.15

10. STABILITY AND REACTIVITY

Chemical Stability:

This material is stable under normal handling and storage conditions described in Section 7.

Conditions To Be Avoided:

dusting conditions

heat

open flame

spark

static electricity

Materials/Chemicals To Be Avoided:

strong bases

strong oxidizing agents

Decomposition Temperature Range:

220 C (428 F)

The Following Hazardous Decomposition Products Might Be Expected:

Decomposition Type: thermal

oxides of phosphorus

Hazardous Polymerization Will Not Occur.

Avoid The Following To Inhibit Hazardous Polymerization:

not applicable

11. TOXICOLOGICAL INFORMATION

Acute Eye Irritation:

Toxicological Information and Interpretation:

eye - eye irritation, rabbit. Severely irritating. Unwashed. Mildly irritating. Washed.

Acute Skin Irritation:

Toxicological Information and Interpretation:

skin - skin irritation, rabbit. Moderately irritating. (At 24 hours.).

Acute Dermal Toxicity:

Toxicological Information and Interpretation:

LD50 - lethal dose 50% of test species, > 300 mg/kg, rabbit.

LD50 - lethal dose 50% of test species, > 7940 mg/kg, rabbit.

Acute Respiratory Irritation:

No test data found for product.

Acute Inhalation Toxicity:

No test data found for product.

Acute Oral Toxicity:

Toxicological Information and Interpretation:

LD50 - lethal dose 50% of test species, 2650 mg/kg, mouse.

Chronic Toxicity:

This product does not contain any substances that are considered by OSHA, NTP, IARC or ACGIH to be "probable" or "suspected" human carcinogens.

No additional test data found for product.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:

No data found for product.

Chemical Fate Information:

No data found for product.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Waste Management options should first consider possible re-use or recycling opportunities. Some

provinces have active "Waste Exchange" networks for re-use and recycling of wastes. Contact your local waste management companies to explore available options. All waste management activities must obey local, provincial and federal regulations. Possible disposal methods include the following:

Place directly into a secure landfill.

14. TRANSPORTATION INFORMATION

Transportation Status: IMPORTANT! Statements below provide additional data on listed DOT classification.

The listed Transportation Classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors.

TDG Status:

Shipping Name: NON DANGEROUS

IMO Status:

Shipping Name: NOT REGULATED

IATA Status:

Shipping Name: NOT REGULATED

15. REGULATORY INFORMATION

Inventory Status

Inventory	Status
UNITED STATES (TSCA)	Y
CANADA (DSL)	Y
EUROPE (EINECS/ELINCS)	Y
AUSTRALIA (AICS)	Y
JAPAN (MITI)	Y
SOUTH KOREA (KECL)	Y

Y = All ingredients are on the inventory.

E = All ingredients are on the inventory or exempt from listing.

P = One or more ingredients fall under the polymer exemption or are on the no longer polymer list. All other ingredients are on the inventory or exempt from listing.

N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing.

Inventory Issues:

All functional components of this product are listed on the TSCA Inventory.

WHMIS Classification:

D-2B : TOXIC MATERIAL

This product has been classified in accordance with the hazard criteria of the CPR (Controlled Products Regulations) and the MSDS contains all the information required by the CPR.

16. OTHER INFORMATION

National Fire Protection Association Hazard Ratings--NFPA(R):

- 2 Health Hazard Rating--Moderate
- 0 Flammability Rating--Minimal
- 0 Instability Rating--Minimal

National Paint & Coating Hazardous Materials Identification System--HMIS(R):

- 2 Health Hazard Rating--Moderate
- 0 Flammability Rating--Minimal
- 0 Reactivity Rating--Minimal

Reason for Revisions:

Change and/or addition made to Section 4.

Key Legend Information:

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

TLV - Threshold Limit Value

PEL - Permissible Exposure Limit

TWA - Time Weighted Average

STEL - Short Term Exposure Limit

NTP - National Toxicology Program

IARC - International Agency for Research on Cancer

ND - Not determined

RPI - INNOPHOS Established Exposure Limits

Disclaimer:

The information herein is given in good faith but no warranty, expressed or implied, is made.

**** End of MSDS Document ****