



SAFETY DATA SHEET

OLIN CORPORATION

Product name: Phosphate Slurry

Issue Date: 04/29/2019

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OLIN CORPORATION encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: Phosphate Slurry

Recommended use of the chemical and restrictions on use

Identified uses: Fertilizer additive

COMPANY IDENTIFICATION

OLIN CORPORATION
190 CARONDELET PLAZA
CLAYTON MO 63105
UNITED STATES

Customer Information Number:

+1 844-238-3445
INFO@OLINBC.com

EMERGENCY TELEPHONE NUMBER

Local Emergency Contact: 1 613-996-6666

2. HAZARDS IDENTIFICATION

Hazard classification

This product is hazardous under the criteria of the Hazardous Products Regulation (HPR) as implemented under the Workplace Hazardous Materials Information System (WHMIS 2015).
Serious eye damage - Category 1

Label elements

Hazard pictograms



Signal word: **DANGER!**

Hazards

Causes serious eye damage.

Precautionary statements**Prevention**

Wear eye protection/ face protection.

Response

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.

Other hazards

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration (w/w)
Water	7732-18-5	> 80.0 - < 94.5 %
Calcium phosphate	7758-23-8	> 3.0 - < 6.0 %
Aluminum phosphate, monobasic	13530-50-2	> 1.0 - < 6.0 %
Ferric phosphate, monobasic	10045-86-0	> 1.0 - < 6.0 %
Sodium fluoride	7681-49-4	> 0.5 - < 2.0 %

4. FIRST AID MEASURES

Description of first aid measures**General advice:**

First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Skin contact: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands.

Eye contact: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed:

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed

Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: In case of fire, use water fog, foam, dry powder, carbon dioxide.

Unsuitable extinguishing media: Do NOT use water jet. May spread fire.

Special hazards arising from the substance or mixture

Hazardous combustion products: Heating or fire conditions liberates toxic gas.

Unusual Fire and Explosion Hazards: Exposure to decomposition products may be a hazard to health.

Advice for firefighters

Fire Fighting Procedures: Standard procedure for chemical fires. Remove undamaged containers from fire area if it is safe to do so.

Special protective equipment for firefighters: In the event of fire, wear self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Avoid dust formation. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Avoid breathing dust. Appropriate protective equipment must be worn when handling a spill of this material. See SECTION 8, Exposure Controls/Personal Protection, for recommendations. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of low areas.

Environmental precautions: Prevent the material from entering drains or water courses. DO NOT CONTAMINATE SURFACE WATER OR DITCHES with chemical or used container.

Methods and materials for containment and cleaning up: Large spills: Dike area to contain spill. Absorb on sand or vermiculite and place in closed container for disposal. Decontaminate spill area

with 10% sodium bicarbonate solution. Absorb decontaminated solution with sand or vermiculite. Sweep up, place in a suitable container and hold for waste disposal. Ventilate area and wash spill site after material pick-up is complete. Avoid access to streams, lakes or ponds. Do not touch or walk through spilled material. Flush away traces with water. Flush cleaned area with water to a sewage treatment facility. See Section 13, Disposal Considerations, for additional information. Small spills: Wipe up with absorbent material (e.g. cloth, fleece). Recover spilled material if possible.

7. HANDLING AND STORAGE

Precautions for safe handling: Provide adequate ventilation. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Avoid prolonged or repeated contact with skin. Wear personal protective equipment. Wash thoroughly after handling. Use good general industrial hygiene practices for handling. Wash thoroughly after handling.

Conditions for safe storage: Store in tightly closed, properly vented containers. Store away from incompatible materials. See STABILITY AND REACTIVITY section.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Consult local authorities for recommended exposure limits.

Component	Regulation	Type of listing	Value/Notation
Aluminum phosphate, monobasic	CA AB OEL	TWA	2 mg/m ³ , Aluminium
Sodium fluoride	CA QC OEL	TWAEV	2 mg/m ³ , Aluminium
	ACGIH	TWA	2.5 mg/m ³ , Fluorine
	CA AB OEL	TWA	2.5 mg/m ³ , Fluorine
	CA QC OEL	TWAEV	2.5 mg/m ³ , Fluorine
	CA BC OEL	TWA	2.5 mg/m ³ , Fluorine

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Sodium fluoride	7681-49-4	Fluoride (Fluorine)	Urine	Prior to shift (16 hours after exposure ceases)	2 mg/l	ACGIH BEI
		Fluoride (Fluorine)	Urine	End of shift (As soon as possible after exposure ceases)	3 mg/l	ACGIH BEI

Exposure controls

Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use chemical goggles.

Skin protection

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Neoprene. Avoid gloves made of: Polyvinyl alcohol ("PVA").

NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Wear clean, body-covering clothing.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator.

The following should be effective types of air-purifying respirators: Particulate filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Slurry
Color	brown
Odor	odourless
Odor Threshold	Not available
pH	8.3 - 8.7
Melting point/range	0 °C <i>Estimated.</i>
Freezing point	0 °C <i>estimated</i>
Boiling point (760 mmHg)	No data available
Flash point	Not available
Evaporation Rate (Butyl Acetate = 1)	No data available
Flammability (solid, gas)	Not applicable
Lower explosion limit	Not available
Upper explosion limit	Not available
Vapor Pressure	Not available
Relative Vapor Density (air = 1)	Not available
Relative Density (water = 1)	1.27 - 1.39

Water solubility	No data available
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	Not available
Decomposition temperature	Not applicable
Kinematic Viscosity	No data available
Explosive properties	Not applicable No
Oxidizing properties	No data available No data available
Softening point	No data available
Molecular weight	Not determined
Pour point	No data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal ambient temperature and pressure.

Chemical stability: No data available

Possibility of hazardous reactions: No dangerous reaction known under conditions of normal use.

Conditions to avoid: contact with incompatible materials

Incompatible materials: Strong oxidizing agents

Hazardous decomposition products: No hazardous decomposition products are known.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity

Low toxicity if swallowed. Swallowing may result in irritation of the mouth, throat, and gastrointestinal tract. May cause nausea and vomiting. May cause abdominal discomfort or diarrhea.

As product: Single dose oral LD50 has not been determined.

Acute dermal toxicity

Prolonged skin contact is unlikely to result in absorption of harmful amounts. The dermal LD50 has not been determined.

Acute inhalation toxicity

No adverse effects are anticipated from single exposure to vapor. The LC50 has not been determined.

Skin corrosion/irritation

Prolonged contact may cause skin irritation with local redness.
Repeated contact may cause skin irritation with local redness.

Serious eye damage/eye irritation

May cause eye irritation.
May cause corneal injury.

Sensitization

Contains component(s) which have demonstrated the potential for contact allergy in mice.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

Contains component(s) which have been reported to cause effects on the following organs in animals:
Kidney.
Liver.
May cause fluorosis of teeth and bones.

Carcinogenicity

No specific, relevant data available for assessment.

Teratogenicity

Fluorides may cause mottling of teeth in children of mothers exposed excessively before or during pregnancy or during lactation. For the minor component(s): Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

Reproductive toxicity

Contains component(s) which did not interfere with reproduction in animal studies.

Mutagenicity

Contains component(s) which were negative in some in vitro genetic toxicity studies and positive in others. Contains component(s) which were negative in some animal genetic toxicity studies and positive in others.

Aspiration Hazard

Based on physical properties, not likely to be an aspiration hazard.

COMPONENTS INFLUENCING TOXICOLOGY:

Calcium phosphate

Acute oral toxicity

LD50, Rat, female, 3,986 mg/kg

Acute dermal toxicity

LD50, Rabbit, male and female, > 2,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity

The LC50 value is greater than the Maximum Attainable Concentration.

LC50, Rat, male and female, 4 Hour, dust/mist, > 2.6 mg/l OECD Test Guideline 403 No deaths occurred at this concentration.

Aluminum phosphate, monobasic

Acute oral toxicity

LD50, Rat, female, > 2,000 mg/kg OECD Test Guideline 420

Acute dermal toxicity

The dermal LD50 has not been determined.

Acute inhalation toxicity

LC50, Rat, male and female, 4 Hour, dust/mist, > 5.1 mg/l OECD Test Guideline 403 No deaths occurred at this concentration.

Ferric phosphate, monobasic

Acute oral toxicity

LD50, Rat, female, > 2,000 mg/kg OECD Test Guideline 420

Acute dermal toxicity

The dermal LD50 has not been determined.

Acute inhalation toxicity

LC50, Rat, male and female, 4 Hour, dust/mist, 5.05 mg/l OECD Test Guideline 436 No deaths occurred at this concentration.

Sodium fluoride

Acute oral toxicity

LD50, Rat, male, 223 mg/kg Other guidelines

LD50, Rat, female, 148.5 mg/kg Other guidelines

Acute dermal toxicity

The dermal LD50 has not been determined.

Acute inhalation toxicity

The LC50 has not been determined.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

Calcium phosphate

Acute toxicity to fish

For similar material(s):

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

For similar material(s):

LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 Hour, > 100 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates

For similar material(s):

EC50, Daphnia magna, static test, 48 Hour, > 100 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants

For similar material(s):

ErC50, Desmodesmus subspicatus (green algae), static test, 72 Hour, Growth rate, > 100 mg/l, OECD Test Guideline 201

For similar material(s):

NOEC, Desmodesmus subspicatus (green algae), static test, 72 Hour, Growth rate, > 100 mg/l, OECD Test Guideline 201

Toxicity to bacteria

For similar material(s):

EC50, activated sludge, static test, 3 Hour, Respiration rates., > 1,000 mg/l, OECD Test Guideline 209

Aluminum phosphate, monobasic

Acute toxicity to fish

For similar material(s):

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

For similar material(s):

LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 Hour, > 100 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), static test, 48 Hour, > 100 mg/l, OECD Test Guideline 202

Toxicity to bacteria

EC50, activated sludge, static test, 3 Hour, Respiration rates., > 1,000 mg/l, OECD Test Guideline 209

Ferric phosphate, monobasic

Acute toxicity to fish

No relevant data found.

Sodium fluoride

Acute toxicity to fish

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Material is not classified as dangerous to aquatic organisms (LC50/EC50/IC50/LL50/EL50 greater than 100 mg/L in most sensitive species).

LC50, Salmo trutta (brown trout), static test, 96 Hour, 164.5 mg/l, Other guidelines

Acute toxicity to aquatic invertebrates

LC50, Daphnia magna (Water flea), 48 Hour, 338 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), 96 Hour, Growth rate inhibition, 272 mg/l, OECD Test Guideline 201 or Equivalent

Chronic toxicity to fish

NOEC, Oncorhynchus mykiss (rainbow trout), static test, 21 d, mortality, 4 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), 21 d, 14 mg/l

Persistence and degradability

Calcium phosphate

Biodegradability: Biodegradability is not applicable to inorganic substances.

Aluminum phosphate, monobasic

Biodegradability: Biodegradability is not applicable to inorganic substances.

Ferric phosphate, monobasic

Biodegradability: Biodegradability is not applicable to inorganic substances.

Sodium fluoride

Biodegradability: Biodegradability is not applicable to inorganic substances.

Bioaccumulative potential

Calcium phosphate

Bioaccumulation: Partitioning from water to n-octanol is not applicable.

Aluminum phosphate, monobasic

Bioaccumulation: Partitioning from water to n-octanol is not applicable.

Ferric phosphate, monobasic

Bioaccumulation: Partitioning from water to n-octanol is not applicable.

Sodium fluoride

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): -0.77 Estimated.

Bioconcentration factor (BCF): 53 - 58 Fish

Mobility in soil

Calcium phosphate

No relevant data found.

Aluminum phosphate, monobasic

No relevant data found.

Ferric phosphate, monobasic

No relevant data found.

Sodium fluoride

Potential for mobility in soil is very high (Koc between 0 and 50).

Partition coefficient (Koc): 14.3 Estimated.

13. DISPOSAL CONSIDERATIONS

Disposal methods: AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

14. TRANSPORT INFORMATION

TDG

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

**Transport in bulk
according to Annex I or II
of MARPOL 73/78 and the
IBC or IGC Code**

Not regulated for transport
Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Not regulated for transport

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Canadian Domestic Substances List (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

16. OTHER INFORMATION

Product Literature

Additional information on this product may be obtained by calling your sales or customer service contact. Ask for a product brochure. Additional information on this and other products may be obtained by visiting our web page.

Hazard Rating System

NFPA

Health	Flammability	Instability
3	1	0

Revision

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Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	ACGIH - Biological Exposure Indices (BEI)
CA AB OEL	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
CA BC OEL	Canada. British Columbia OEL
CA QC OEL	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants
TWA	8-hour time weighted average
TWAEV	Time-weighted average exposure value

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA -

Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

OLIN CORPORATION urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

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