



Uniphos Chemicals

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Safety Data Sheet

1. Identification

1.1 Product Identifier

Trade Name	XF-321S(HPMA)
Chemical Name	Homopolymer of Maleic Acid

1.2 Recommended use of the Chemical and Restrictions on use

Recommended Use	Used as dispersant and scale inhibitor in cooling water treatment, Reverse Osmosis systems and many other scale control applications
Restrictions on use	None known

1.3 Supplier's Details

Company Name	Nantong Uniphos Chemicals Co., Ltd.
Address	No. 8, Tonghai 2nd Road Rudong Coastal Economic Development Zone, Nantong 226407, China
Telephone NO.	+86-513-6990 8111

1.4 Emergency Telephone Number

Telephone NO.	+86-519-83860599
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2. Hazards Identification

2.1 Classifications of the substance

Corrosive to metals	Category 1
Skin corrosion / Irritation	Category 2
Serious eye damage / eye irritation	Category 1
Skin sensitization	Category 1

2.2 Label Elements

Symbol		
Signal Word	Danger!	
Hazard Statement	H290	May be corrosive to metals.
	H315	Cause skin irritation!
	H318	Cause serious eye damage!
	H317	May cause an allergic skin reaction.

2.3 Precautionary Statement

Prevention	
P234	Keep only in original container.
P261	Avoid breathing dusts/fume/gas/mists/vapours/spray.
P264	Wash hands and contaminated body thoroughly after handling.
P272	Contaminated work clothing should not be allowed out of the workplace.
P280	Wear protective gloves/clothing, eye protection and face protection.
Response	
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P321	Specific treatment (Refer to supplemental first aid instruction)
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P362	Take off contaminated clothing and wash before reuse.
P310	Immediately call a POISON CENTRE or doctor/physician if you feel unwell
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P390	Absorb spillage to prevent material damage.
Storage	
P406	Store in corrosive resistant container with a resistant inner liner.
Disposal	
P501	Dispose of contents / container in accordance with local / regional / national / international regulations.

3. Composition / Information on ingredients

Ingredients (Chemical Name)	CAS NO.	Concentration Range
Homopolymer of maleic acid	26099-09-2	48.0 –52.0%
Fumaric Acid	110-17-8	≤0.5%
Maleic Acid	110-16-7	≤4.0%
Water	7732-18-5	remained
Total		100%

4. First-aid measures

4.1 Description of first-aid measures

General Advice	Take off immediately all contaminated clothing; Wash before re-use.
Eye Contact	Get medical attention immediately. Call a poison center or physician. Immediately flush with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Skin Contact Skin Contact	<p>Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.</p>
Inhalation	<p>Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In the event of any complaints or symptoms, avoid further exposure.</p>
Ingestion:	<p>Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.</p>
Protection of First-aiders	<p>No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.</p>

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact: Causes serious eye damage.

Inhalation: May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin contact: Causes skin irritation. May cause an allergic skin reaction.

Ingestion: May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact: Adverse symptoms may include the following:
 pain
 watering
 redness

Inhalation: Adverse symptoms may include the following:
wheezing and breathing difficulties
asthma

Skin contact: Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion: Adverse symptoms may include the following:
stomach pains

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician:

Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments:

No specific treatment.

5. Fire-fighting Measures

5.1 Suitable Extinguishing Media

Water spray (fog), foam, dry chemical, or carbon dioxide

5.2 Unsuitable Extinguishing Media

None known

5.3 Specific hazards arising from the chemical

In a fire or if heated, a pressure increase will occur and the container may burst. Decomposition products may include Carbon monoxide (CO), carbon dioxide

5.4 Special protective actions for fire-fighters

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel:

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders:

If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). May be harmful to the environment if released in large quantities.

6.3 Methods and materials for containment and cleaning up**Small spill:**

Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill:

Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. The spilled material may be neutralized with sodium carbonate, sodium bicarbonate or sodium hydroxide. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product.

6.4 Reference to other sections

See Section 1 for emergency contact information. See Section 8 for information on appropriate personal protective equipment. See Section 13 for additional waste treatment information.

7. Handling and Storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling**Protective measures:**

Put on appropriate personal protective equipment (see section 8). Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible

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material, kept tightly closed when not in use. Keep away from alkalis. Empty containers retain product residue and can be hazardous. Do not reuse container. Spillages should be cleaned up promptly to avoid damage to surrounding materials.

Advice on general occupational hygiene:

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities:

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Store in corrosive resistant container with a resistant inner liner. Store locked up. Separate from alkalis. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

7.3 Specific end use(s) Recommendations:

Not available.

Industrial sector specific solutions:

Not available.

8. Exposure Controls / Personal Protection

8.1 Control parameters

Occupational exposure limits

No exposure limit value known.

Recommended monitoring procedures:

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances.

DNELs/DMELs

No DNELs/DMELs available.

PNECs

No PNECs available

8.2 Exposure controls**Appropriate****engineering controls:**

Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures**Hygiene measures:**

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection:

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

Skin protection**Hand protection:**

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection:

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection:

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection:

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Environmental exposure controls:

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Appearance	clear yellow to amber liquid
Odour	Mild
Odour threshold	Not available
pH (1% solution) @ 25°C	≤2.0
Melting point/Freezing point	-5°C
Initial Boiling point and boiling range	100-102°C
Flash Point	Not available
Evaporation rate	Not available
Flammability	Not flammable
Flammability: Lower/Upper	Not flammable
Explosive Limits: Lower/ Upper	Not explosive
Vapour pressure	Not available
Vapour density	Not available
Relative density(water = 1)	1.16-1.22 (20°C)
Solubility	Completely miscible
Partition coefficient: n-octanol / water	Not available
Auto-ignition Temperature	Not available
Decomposition temperature	Not available
Viscosity	10 - 60 cps @ 25°C
Melting point/Freezing point	-5°C
Initial Boiling point and boiling range	100-102°C
Flash Point	Not available
Evaporation rate	Not available
Flammability	Not flammable
Flammability: Lower/Upper	Not flammable
Explosive Limits: Lower/ Upper	Not explosive
Vapour pressure	Not available
Vapour density	Not available
Relative density(water = 1)	1.16-1.22 (20°C)
Solubility	Completely miscible
Partition coefficient: n-octanol / water	Not available
Auto-ignition Temperature	Not available
Decomposition temperature	Not available
Viscosity	10 - 60 cps @ 25°C

10. Stability and Reactivity

10.1 Reactivity:

No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability:

The product is stable.

10.3 Possibility of hazardous reactions:

Under normal conditions of storage and use, hazardous reactions will not occur.

- 10.4 Conditions to avoid:** No specific data.
- 10.5 Incompatible materials:** Reactive or incompatible with the following materials:
alkalis
metals
oxidizing materials
Inorganic sulfite salt.
Nitrite salt.
- 10.6 Hazardous decomposition products:** Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. Toxicological information

This product has not been tested for toxicity, but data obtained on similar products are summarized below:

(A) Acute Toxicity

Test	Results	Basis
Oral Toxicity (Rats)	Practically nontoxic	LD 50, 15,000 mg/kg
Dermal Toxicity (Rats)	Practically nontoxic	LD 50, 1,560 mg/kg
Inhalation Toxicity, Vapor (Rats)	Severely irritating	Product Test Data.
Conclusion/Summary: Conclusive but not sufficient for classification.		

Other Information

Items	Results
Skin corrosion / Irritation	Cause skin irritation!
Serious eye damage / Irritation	Cause serious eye damage!
Respiratory or skin sensitization	May cause an allergic skin reaction.
Germ cell mutagenicity	No genetic effects were noted in standard bacterial tests.
Carcinogenicity	Not available
Reproductive toxicity	No adverse effects reported in repeat dose studies.
STOT-Single exposure	Not available
STOT-repeated exposure	Not available
Aspiration hazard	Not available

12. Ecological Information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
Maleic Acid			
	Acute EC50 316,2 mg/l Fresh water	Water flea	2 d
XF-321S (HPMA)			
	Acute LC50 > 100 mg/l Fresh water	Rainbow trout, onaldson trout	96 h
	Acute LC50 > 100 mg/l Fresh water	common carp	96 h

	Acute EC50 > 1.000 mg/l Fresh water	Water flea	48 h
Remarks – Acute – Aquatic invertebrates.: Conclusive but not sufficient for classification.			

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose
XF-321S (HPMA)	302B Inherent Biodegradability: Zahn-Wellens/EMPA Test	18 % - Not readily biodegradable. - 35 d	mg/l
Remarks: No known significant effects or critical hazards. Conclusion/Summary: Not readily biodegradable.			

12.3 Bioaccumulative potential

Product/ingredient name	LogPow	BCF	Potential
XF-321S (HPMA)		35	low

12.4 Mobility in soil

Soil/water partition coefficient (KOC) : Not available.
Mobility : Not applicable.

12.5 Results of PBT and vPvB assessment

PBT: P: No.
B: No.
T: No.
vPvB: vP: No.
vB: No.

12.6 Other adverse effects: No known significant effects or critical hazards.

13. Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal:	The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
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Hazardous waste:	Within the present knowledge of the supplier, this product is not regarded as hazardous waste, as defined by EU Directive 91/689/EEC.
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European waste catalogue (EWC):

Waste code	Waste designation
	Not available.

Packaging:

Methods of disposal:	The generation of waste should be avoided or minimized wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.
Special precautions:	This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

14. Transport Information

UN NO.	3265
UN Proper shipping name	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. Homopolymer of Maleic Acid
Transport Hazard Class	8
Packing Group	II
Environmental hazards	No.
Transport label	
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code. No data available	

15. Regulatory Information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****EU Regulation (EC) No. 1907/2006 (REACH)****Annex XIV - List of substances subject to authorization****Annex XIV:****Substances of very high concern:**

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles:	Not applicable.
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Other EU regulations

Europe inventory:	All components are listed or exempted.
Integrated pollution prevention and control list (IPPC) – Air:	Not listed
Integrated pollution prevention and control list (IPPC) – Water:	Not listed

National regulations**International regulations****Chemical Weapon Convention List Schedules I, II & III Chemicals****Chemical Weapons Convention List Schedule I Chemicals**

None of the components are listed.

Chemical Weapons Convention List Schedule II Chemicals

None of the components are listed.

Chemical Weapons Convention List Schedule III Chemicals

None of the components are listed.

Montreal Protocol (Annexes A, B, C, E)

None of the components are listed.

Stockholm Convention on Persistent Organic Pollutants**Annex A - Elimination - Production**

None of the components are listed.

Annex A - Elimination - Use

None of the components are listed.

Annex B - Restriction - Production

None of the components are listed.

Annex B - Restriction - Use

None of the components are listed.

Annex C - Unintentional - Production

None of the components are listed.

Rotterdam Convention on Prior Inform Consent (PIC)

None of the components are listed.

UNECE Aarhus Protocol on POPs and Heavy Metals**Heavy metals - Annex 1**

None of the components are listed.

POPs - Annex 1 - Production

None of the components are listed.

POPs - Annex 1 - Use

None of the components are listed.

POPs - Annex 2

None of the components are listed.

POPs - Annex 3

None of the components are listed.

International lists:**National inventory:**

Australia:	All components are listed or exempted.
Canada:	All components are listed or exempted.
China:	All components are listed or exempted.
Japan:	Not determined.
Malaysia:	Not determined.
New Zealand:	All components are listed or exempted.
Philippines:	All components are listed or exempted.
Republic of Korea:	All components are listed or exempted.
Taiwan:	All components are listed or exempted.
United States:	All components are listed or exempted.

15.2 Chemical Safety Assessment:

This product contains substances for which Chemical Safety Assessments are still required.

16. Other Information

Abbreviations and acronyms:	<p>ATE = Acute Toxicity Estimate CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008] DMEL = Derived Minimal Effect Level DNEL = Derived No Effect Level EUH statement = CLP-specific Hazard statement PBT = Persistent, Bioaccumulative and Toxic PNEC = Predicted No Effect Concentration RRN = REACH Registration Number vPvB = Very Persistent and Very Bioaccumulative</p>
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Date	July 22,2019
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