

松石科技
Pinestone

上海松石富禧科技有限公司

武汉松石富禧国际贸易有限公司

Shanghai Pinestone Fortune Technology Co., Ltd.,
(Wuhan Pinestone Fortune International Trading Co., Ltd.)

Address: Room 1823, Tower T2, Upper West Space, No.80, Lane 689 Liquan Road,
Putuo District, Shanghai, P.R.China
Tele: +86-27-85615901/85615902
Web: www.pinestonetrading.com



中国 · 武汉 · 上海
CHINA · WUHAN · SHANGHAI

Pinestone Introduction

Shanghai Pinestone Fortune Technology Co., Ltd., a newly established company, is set to assume all business operations of Wuhan Pinestone Fortune International Trading Co., Ltd., ensuring a seamless continuation of services to all existing and future customers.

This strategic evolution builds upon a solid foundation. Wuhan Pinestone Fortune International Trading Co., Ltd. specializes in electroplating additives, chemical intermediates, surfactants, electroplating wastewater treatment agents, electroplating equipment and electrolyte additives for lithium-ion batteries.

Founded in 2005, the company attaches great importance to technological innovation and R&D, and has continuously invested substantial capital and technical resources in scientific research. It now operates an R&D center covering over 4,000 square meters, located at its plants in Yangluo Economic Development Zone and Xiantao. Equipped with advanced precision instruments and standardized laboratories with multiple physical and chemical analysis rooms, as well as a full range of test facilities, the center is capable of carrying out multiple different experiments simultaneously.

As a leading enterprise in China's metal finishing industry, Wuhan Pinestone runs four large-scale chemical manufacturing plants in Xiantao, Yangluo, Qianjiang and Yingcheng, focusing on chemical R&D and innovation. The company has obtained certifications including ISO 14001 Environmental Management System, ISO 45001 Occupational Health and Safety Management System, ISO 9001 Quality Management System and IATF 16949 Automotive Quality Management System. It is also recognized as a National High-tech Enterprise and a National Specialized, Refined, Differential and Innovative "Little Giant" Enterprise.

The company has established long-term and extensive technical cooperation with Wuhan University, Hubei University, Wuhan Polytechnic University, Wuhan University of Technology, Central China Normal University and relevant professional institutes and research institutions in the fields of organic synthesis, fine chemicals, bioengineering and so on.

The company has established long-term and extensive technical cooperation with Wuhan University, Hubei University, Wuhan Polytechnic University, Wuhan University of Technology, Central China Normal University and relevant professional institutes and research institutions in the fields of organic synthesis, fine chemicals, bioengineering and so on.

Pinestone Technology Development

松石科技创事纪













松石科技
Pinestone

IATF16949

Honorary Qualification







ISO 9001



ISO 14001



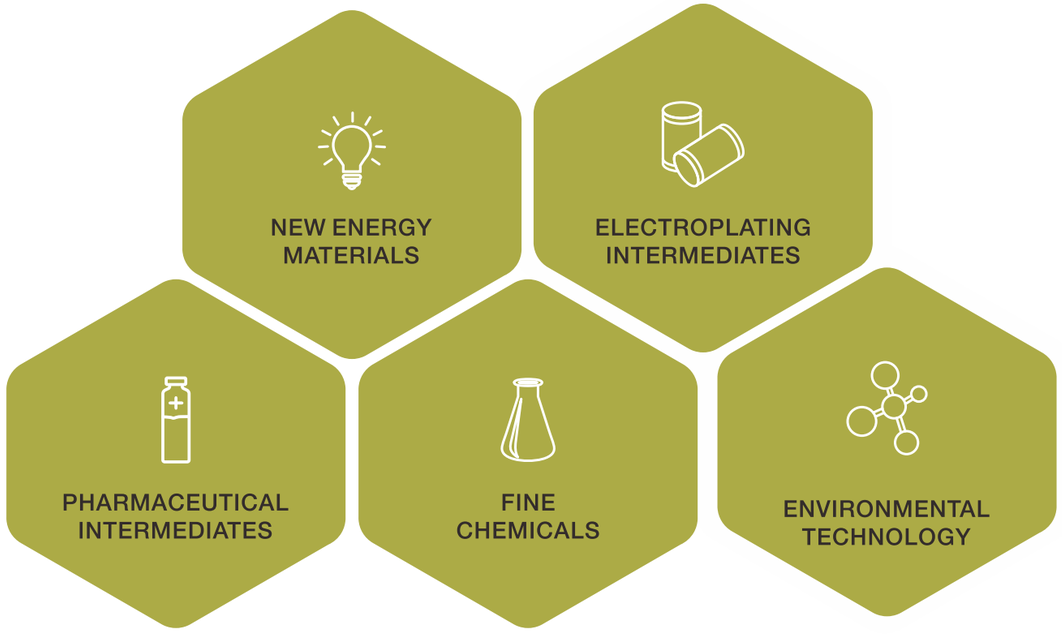
OHSAS 18001

PINESTONE BUSINESS STRENGTH

Complete product specifications, wide range of applications

As an industry leader in domestic and international market of R&D and production of electroplating, Pinestone Technology boasts complete product specifications, which fully meet different customer demands, and was widely used in various industries such as electroplating, pharmaceutical, polymer modification, petroleum, photographic materials, lithium batteries, household chemicals, dyes, biochemistry, wastewater treatment, emulsion polymerization, surfactants etc..

CORE BUSINESS



松石科技
Pinestone

CONTENTS 目录

products	Page
Electroplating intermediates	
Nickel electroplating	
PME	09
BEO	09
BMP	09
PAP	10
ALS	10
VS	10
PPS	11
PPS-OH	11
PS	11
DEP	12
TC-DEP	12
ATP	12
ATPN	13
PN	13
TC-EHS	13
SBS	14
BOZ	14
TCA	14
HD-M	15
BBI	15
PABS	15
POPS	16
DEPS	16
HBOPS-Na	16
SSO3	17
POPDH	17
the others	18
Zinc electroplating	
OCBA	21
TC-BAR	21
BPC	21
PUB	22
GC-01/14-90	22
FXS/15-90	22
IME	23
IZE	23
MOME	24
EN/16-80	24
MAA	24
the others	25
Acid Copper electroplating	
SPS	28
DPS	28
UPS	29
ZPS	29
NPE	29
Electroless Copper plating	
Q75/EDTP	31
OPX	32
Intermediates for electrolyte of lithium ion battery	
1.3-PS	35
1.4-BS	36
2.4-BS	36
Materials for electroplating /others	39

Electroplating intermediates

Nickel electroplating

松石科技
Pinestone

Nickel electroplating	Page
PME	09
BEO	09
BMP	09
PAP	10
ALS	10
VS	10
PPS	11
PPS-OH	11
PS	11
DEP	12
TC-DEP	12
ATP	12
ATPN	13
PN	13
TC-EHS	13
SBS	14
BOZ	14
TCA	14
HD-M	15
BBI	15
PABS	15
POPS	16
DEPS	16
HBOPS-Na	16
SSO3	17
POPDH	17
the others	18

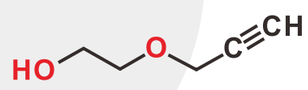
Electroplating intermediates

Nickel electroplating

PME

chemical name: **Propynolethoxylate**
Molecularformula: $C_5H_8O_2$
Molecular weight: **100.12**
CAS NO: **3973-18-0**
Appearance: **Colorless to pale yellow liquid**
Assay: **⩾98%**

structure:



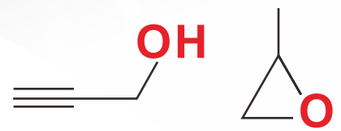
Application

Adding PME to nickel electroplating electrolyte, it acts as leveling agent and brightener to improve the leveling effect and brightness of nickel coating.

PAP

chemical name: **Propargyl alcohol propoxylate**
Molecularformula: $C_6H_{10}O_2$
Molecular weight: **114.14**
CAS NO: **38172-91-7**
Appearance: **Pale yellow liquid**
Assay: **98%/65%**

structure:



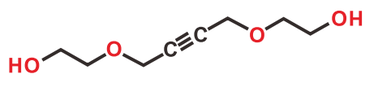
Application

PAP acts as leveling agent and brightener for nickel electroplating, improving leveling and brightness of nickel deposit.

BEO

chemical name: **Butynediol ethoxylate**
Molecularformula: $C_8H_{14}O_4$
Molecular weight: **174.19**
CAS NO: **1606-85-5**
Appearance: **Yellow viscous liquid**
Assay: **⩾98%**

structure:



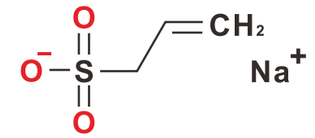
Application

BEO is a lasting brightener with weak leveling property, used in nickel electroplating system to obtain bright nickel coating.

ALS

chemical name: **Sodium allyl sulfonate**
Molecularformula: $C_3H_5NaO_3S$
Molecular weight: **144.12**
CAS NO: **2495-39-8**
Appearance: **Colorless transparent liquid**
Assay: **25%/35%**

structure:



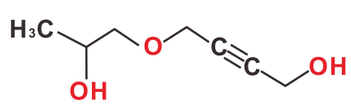
Application

ALS is used as assistant brightener in nickel electroplating, refining crystal grains and improving coating ductility.

BMP

chemical name: **Butynediol propoxylate**
Molecularformula: $C_7H_{12}O_3$
Molecular weight: **144.17**
CAS NO: **1606-79-7**
Appearance: **Pale yellow transparent liquid**
Assay: **⩾98%**

structure:



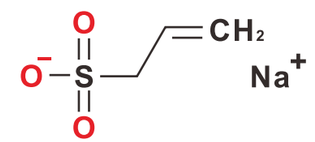
Application

BMP is a lasting brightener with weak leveling property, applied to nickel electroplating to enhance coating brightness.

VS

chemical name: **Sodium vinylsulfonate**
Molecularformula: $C_2H_3NaO_3S$
Molecular weight: **130.10**
CAS NO: **3039-83-6**
Appearance: **Colorless liquid**
Assay: **25%**

structure:



Application

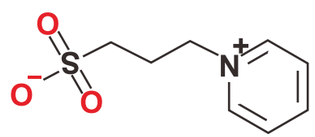
SVS serves as assistant brightener for nickel plating, improving ductility and reducing internal stress of deposit.

松石科技
Pinestone

PPS

chemical name: **3-Pyridinium propyl sulfonate**
Molecularformula: $C_8H_{11}NO_3S$
Molecular weight: **201.24**
CAS NO: **15471-17-7**
Appearance: **White solid**
Assay: **⩾99%**

structure:



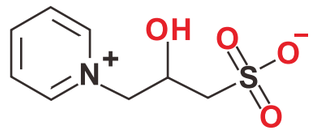
Application

PPS is leveling agent and brightener for nickel electroplating with strong leveling capacity, improving brightness and leveling of nickel coating.

PPS-OH

chemical name: **Pyridinium hydroxy propyl sulfobetaine**
Molecularformula: $C_8H_{11}NO_4S$
Molecular weight: **217.24**
CAS NO: **3918-73-8**
Appearance: **Colorless to pale yellow transparent liquid**
Assay: **40%/45%/78%**

structure:



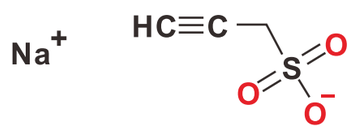
Application

PPS-OH is leveling agent for nickel electroplating, showing excellent leveling performance in low current density area.

PS

chemical name: **Propynesulfonic acid sodium salt**
Molecularformula: $C_3H_3NaO_3S$
Molecular weight: **142.11**
CAS NO: **55947-46-1**
Appearance: **Pale yellow liquid**
Assay: **20%/25%**

structure:



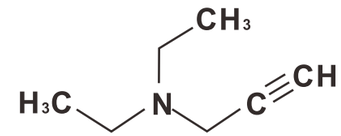
Application

PS is impurities tolerance agent for nickel electroplating, enhancing the tolerance of plating bath to metal impurities.

DEP

chemical name: **1-Diethylamino-2-propyne**
Molecularformula: $C_7H_{13}N$
Molecular weight: **111.19**
CAS NO: **4079-68-9**
Appearance: **Colorless or pale yellow transparent liquid**
Assay: **98%**

structure:



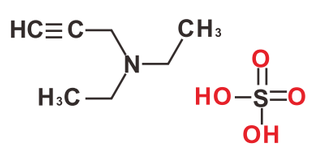
Application

DEP acts as leveling agent and brightener for nickel electroplating, improving leveling and brightness in high current zone.

TC-DEP

chemical name: **1-Diethylamino-2-propyne, sulfate**
Molecularformula: $C_7H_{15}NO_4S$
Molecular weight: **209.26**
CAS NO: **84779-61-3**
Appearance: **Colorless to pale yellow transparent liquid**
Assay: **50%**

structure:



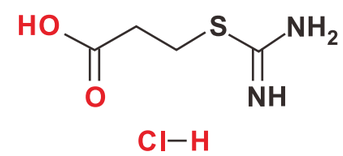
Application

TC-DEP 50 is used in nickel electroplating as leveling agent and brightener to improve the leveling property of nickel coating.

ATP

chemical name: **Carboxyethylisothiouronium chloride**
Molecularformula: $C_3H_6N_2O_2S \cdot HCl$
Molecular weight: **170.62**
CAS NO: **5425-78-5**
Appearance: **White solid**
Assay: **98%**

structure:



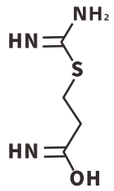
Application

ATP is impurities tolerance agent for nickel electroplating, masking metal impurities and reducing pinholes on coating.

ATPN

chemical name: **3-Isothioureidopropionic acid**
Molecularformula: $C_4H_8N_2O_2S$
Molecular weight: **148.18**
CAS NO: **5398-29-8**
Appearance: **White or pale yellow crystalline powder**
Assay: **⩾98%**

structure:



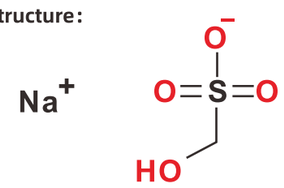
Application

ATPN is impurity tolerance agent & low current throwing agent for nickel plating, improving covering power and throwing power in low current density area. Suitable for bright acid nickel plating & Ni-Fe alloy plating. Excess dosage will reduce coating brightness.

PN

chemical name: **Hydroxymethanesulfonic acid monosodium salt**
Molecularformula: CH_3NaO_4S
Molecular weight: **134.09**
CAS NO: **870-72-4**
Appearance: **White crystalline powder**
Assay: **28%**

structure:



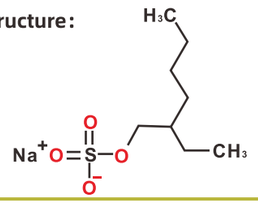
Application

PN is complexing agent for nickel electroplating, complexing metal ions and stabilizing plating bath system.

TC-EHS

chemical name: **2-Ethylhexyl sulphate sodium salt**
Molecularformula: $C_8H_{17}NaO_4S$
Molecular weight: **232.27**
CAS NO: **126-92-1**
Appearance: **Colorless liquid**
Assay: **40%**

structure:



Application

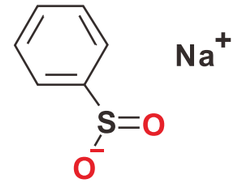
TC-EHS is wetting agent for nickel electroplating, reducing surface tension of plating bath and preventing pinholes.



SBS

chemical name: **Sodium benzenesulfinate**
Molecularformula: $C_6H_5NaO_2S$
Molecular weight: **164.16**
CAS NO: **873-55-2**
Appearance: **White powder**
Assay: **99%**

structure:



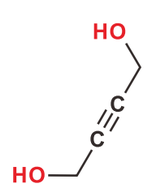
Application

SBS is throwing agent for nickel electroplating, improving covering power of coating in low current density area.

BOZ

chemical name: **1,4-Butynediol**
Molecularformula: $C_4H_6O_2$
Molecular weight: **86.09**
CAS NO: **110-65-6**
Appearance: **White solid**
Assay: **98%**

structure:



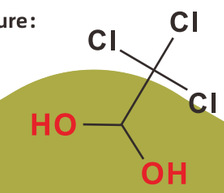
Application

BOZ is brightener for nickel electroplating to quickly obtain bright nickel coating.

TCA

chemical name: **Chloral hydrate**
Molecularformula: $C_2H_3Cl_3O_2$
Molecular weight: **165.4**
CAS NO: **302-17-0**
Appearance: **colorless transparent crystalline solid**
Assay: **99%**

structure:



Application

TCA is mainly used as a potential difference regulator for semi-bright nickel in the electroplating industry.

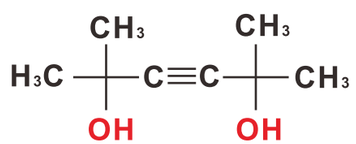


松石科技
Pinestone

HD-M

chemical name: 2,5-Dimethyl-3-hexyne-2,5-diol
Molecularformula: $C_8H_{14}O_2$
Molecular weight: 142.2
CAS NO: 142-30-3
Appearance: white to off-white crystalline solid
Assay: 99%

structure:



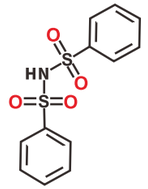
Application

HD-M is used as a levelling agent and brightener for electroplating semi-bright nickel.

BBI

chemical name: Bis(benzene sulphony)-imide
Molecularformula: $C_{12}H_{11}NO_4S_2$
Molecular weight: 297.35
CAS NO: 2618-96-4
Appearance: white to off-white powder
Assay: 80%

structure:



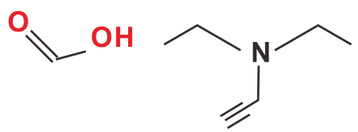
Application

It acts as an auxiliary brightener and primary brightener for nickel plating. It improves the ductility of the deposit, whitens the coating and provides impurity resistance.

PABS

chemical name: Diethylaminopropyne formate
Molecularformula: $C_8H_{15}NO_2$
Molecular weight: 157.2
CAS NO: 125678-52-6
Appearance: Clear colorless or yellowish liquid
Assay: ≥70%

structure:



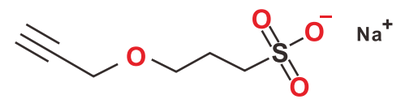
Application

Main Application:Leveling agent, brightener.

POPS

chemical name: Propargyl-3-sulfopropylether, Na salt
Molecularformula: $C_6H_9NaO_4S$
Molecular weight: 200
CAS NO: 30290-53-0
Appearance: Yellow liquid
Assay: Approx. 45%

structure:



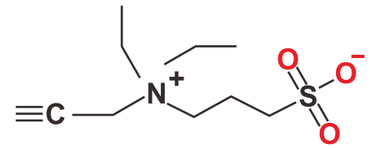
Application

Main Application:POPS-liquid is the aqueous solution of Propargyl-3-sulfopropylether, Na salt. In the electroplating industry it is used for the productionof brightener systems for the bright nickel bath. In the formulations it works as aleveler in combination with PPS or PPS-OH.

DEPS

chemical name: 3-[diethyl(prop-2-ynyl)azaniumyl]propane-1-sulfonate
Molecularformula: $C_{10}H_{19}NO_3S$
Molecular weight: 233
CAS NO: 70155-90-7
Appearance: White or lightly yellow powder
Assay: ≥95%

structure:



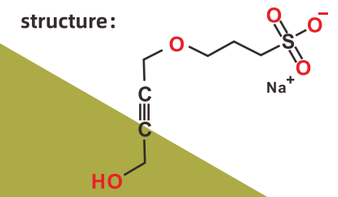
Application

Main ApplicationDEPS is used as brightener and leveling agent in nickel baths, very goodresults are obtained if used together with PPS,POPS,HBOPS-Na, which improve special levelerof the high area.

HBOPS-Na

chemical name: Butynediol sulfopropyl ether sodium
Molecularformula: $C_7H_{11}NaO_5S$
Molecular weight: 230
CAS NO: 90268-78-3
Appearance: Red liquid
Assay: Approx. 50%

structure:



Application

Main Application:HBOPS-Na is an acetylenic compound used as leveling agent in theformulation of electrolytic Watts bright nickel baths. It is also works in the bath as a secondarybrightener. Usually, HBOPS-Na is combined with saccharin, PPS or PPSOH and wettingagents. Best results are obtained with PPS and POPS.

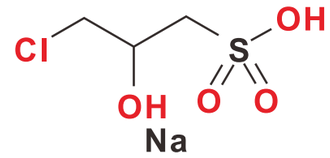


松石科技
Pinestone

SSO3

chemical name: Derivative from sodiumsalt of 3-chloro-2-hydroxy-propylsulfate
Molecularformula: $C_3H_6ClNaO_4S$
Molecular weight: 196
CAS NO: 126-83-0
Appearance: Clear colorless liquid
Assay: ≥55%

structure:



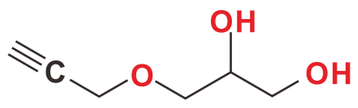
Application

Main Application:Impurities tolerance agent, it can improve covering power at low current region.

POPDH

chemical name: Propargyl-oxo-propane-2,3-dihydroxy
Molecularformula: $C_6H_{10}O_3$
Molecular weight: 130.14
CAS NO: 13580-38-6
Appearance: Clear yellow liquid
Assay: ≥50%

structure:



Application

Main Application:Used with derivative of alkyne-alcohol,synergistic brightness to enhance leveling and filling up ability at low current region.

镀镍系列其它产品
the others

	化学名 Chemical name	CAS NO	分子式 Molecular formula
MBS	间硝基苯磺酸钠 3-Nitrobenzenesulfonic Acid Sodium Salt	127-68-4	$C_6H_4NNaO_5S$
SAS	烯丙基磺酸钠 Sodium allylsulfonate	2495-39-8	$C_3H_5NaO_3S$
/	葡萄糖酸钠 Sodium gluconate	527-07-1	$C_6H_{11}NaO_7$
/	糖精钠 Sodium saccharine	128-44-9	$C_7H_4NNaO_3S$
/	次磷酸钠 Sodium hypophosphite	7681-53-0	NaH_2PO_2

Electroplating intermediates

Zinc electroplating

松石科技
Pinestone

Zinc electroplating	Page
OCBA	21
TC-BAR	21
BPC	21
PUB	22
GC-01/14-90	22
FXS/15-90	22
IME	23
IZE	23
MOME	24
EN/16-80	24
MAA	24
the others	25

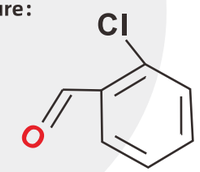
Electroplating intermediates

Zinc electroplating

OCBA

chemical name: **O-chlorobenzaldehyde**
Molecularformula: **ClC_6H_4CHO**
Molecular weight: **140.57**
CAS NO: **89-98-5**
Appearance: **Colorless to pale yellow acicular crystals**
Assay: **99%**

structure:



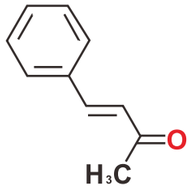
Application

OCBA acts as the primary brightener for acid zinc plating. It can refine grain structure and improve the brightness and leveling performance of the zinc deposit.

TC-BAR

chemical name: **Benzalacetone**
Molecularformula: **$C_{10}H_{10}O$**
Molecular weight: **146.19**
CAS NO: **122-57-6**
Appearance: **White to pale yellow crystals**
Assay: **99%**

structure:



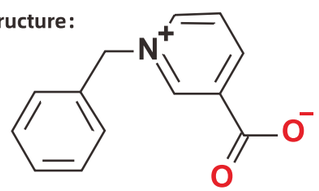
Application

TC-BAR serves as the primary brightener for acid zinc plating, significantly improving the brightness and leveling ability of the zinc deposit.

BPC

chemical name: **1-benzylpyridinium**
Molecularformula: **$C_{13}H_{11}NO_2$**
Molecular weight: **213.24**
CAS NO: **15990-43-9**
Appearance: **Pale yellow to reddish brown clear liquid**
Assay: **48%**

structure:



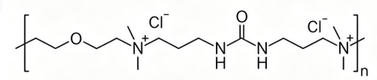
Application

BPC48 is a top brightener and leveling agent in alkaline zinc plating. It refines grains and yields mirror-bright zinc deposits, suitable for cyanide and cyanide-free alkaline zinc baths.

PUB(Mirapol WT)

chemical name: **Polyquaternium-2**
Molecularformula: **$C_{15}H_{34}CL_2N_4O_2$**
Molecular weight: **约等于114.14**
CAS NO: **68555-36-2**
Appearance: **Colorless or pale yellow viscous liquid**
Assay: **62%**

structure:



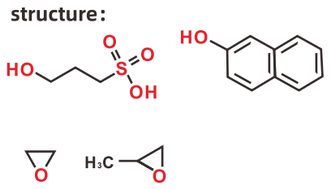
Application

It is a polyurea quaternary ammonium cationic surfactant, mainly used in alkaline zinc plating and copper plating. It can effectively equalize the deposit thickness in high and low current density areas. It can also be applied in cosmetics, shampoos, skin care products and cleaning agents.

GC-01/14-90

chemical name: **Polyethylen/propylenglycol (beta-naphthy) (3-sulfopropy) dietherkallumsalz**
Molecularformula:
Molecular weight:
CAS NO: **120478-49-1**
Appearance: **Yellow or brown viscous liquid**
Assay: **75%**

structure:



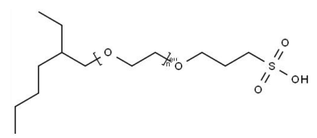
Application

GC-01 is an anionic surfactant.It is a purifying agent in the electroplating process,especially inacid zinc plating.As a sulfonate,it is resistant to hydrolysis and can increase turbidity whencombined with nonionic surfactants,and it is easily soluble in benzalacetone,improvinguniformity.Used at high temperature,the deposited coating is bright and has good corrosionresistance.

FXS/15-90

chemical name: **Anionic surfactant and carrier**
Molecularformula: **$(C_2H_{40})nC_{11}H_{24}O_4S \cdot K$**
Molecular weight:
CAS NO: **3918-73-8**
Appearance: **Yellow to brown liquid or cream**
Assay: **75%**

structure:



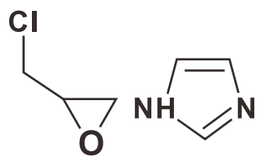
Application

FXS is an anionic, low foaming surfactant without a cloud point. As a sulfonate FXS is stable against hydrolysis over a wide pH range.

IME

chemical name: **Aqueous anodic polymer**
Molecularformula: **$C_6H_9ClN_2O$**
Molecular weight: **160.6**
CAS NO: **68797-57-9**
Appearance: **Pale yellow to brownish yellow clear liquid**
Assay: **35%**

structure:



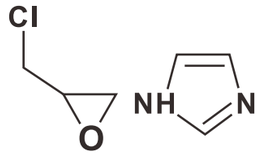
Application

Used as brightener & leveller for alkaline zinc plating (cyanide / cyanide-free zincate bath). Improve throwing power and low-current brightness, suitable for hardware & automotive components.

IZE

chemical name: **Aqueous anodic polymer**
Molecularformula: **$C_6H_9ClN_2O$**
Molecular weight: **160.6**
CAS NO: **68797-57-9**
Appearance: **Pale yellow to brownish yellow clear liquid**
Assay: **46%**

structure:



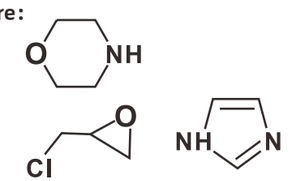
Application

Used as brightener & leveller for alkaline zinc plating (cyanide / cyanide-free zincate bath). Improve throwing power and low-current brightness, suitable for hardware & automotive components.

MOME

chemical name: **Aqueous cationic polymer**
Molecularformula: **$C_{10}H_{18}ClN_3O_2$**
Molecular weight: **247.72**
CAS NO: **109882-76-0**
Appearance: **Brown-red clear liquid**
Assay: **60%**

structure:



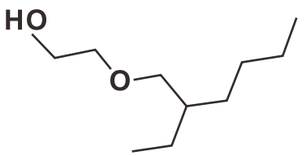
Application

MOME is cationic polymer electroplating intermediate, main brightener for alkaline cyanide-free zinc plating and cyanide zinc plating.

EN/16-80

chemical name: **surface active agent**
Molecularformula: **$C_{24}H_{50}O_9$**
Molecular weight: **482.63**
CAS NO: **26468-86-0**
Appearance: **Colorless to pale yellow clear liquid**
Assay: **80%**

structure:



Application

EN/16-80 is nonionic surfactant electroplating intermediate. Widely used in acid zinc plating, acid tin plating, zinc-nickel alloy plating.

MAA

Appearance: **Pale yellow to brownish yellow clear liquid**
Assay: **46%**

Application

Main Application: When formulated into alkaline zinc plating additives, it enables the coatingto maintain good functional properties while improving its decorative performance, such as brightness and throwing power.
Anisaldehyde (p-Anisaldehyde/4-Methoxybenzaldehyde) is an excellent brightener for cyanide-freezinc plating. It can enhance the brightness and uniformity of deposits over a wide current density range.It is used in combination with zinc plating intermediates PUB, BPC-48 and IME.

镀锌系列其它产品
the others

	化学名 Chemical name	CAS NO	分子式 Molecular formula
/	七水硫酸锌 Zinc sulfate Heptahydrate	7446-20-0	$ZnSO_4 \cdot 7H_2O$
/	苯甲酸钠 Sodium benzoate	532-32-1	$C_7H_5NaO_2$
/	片碱 Sodium hydroxide	1310-73-2	NaOH
/	氯化锌 Zinc chloride	7646-85-7	$ZnCl_2$

Electroplating intermediates

/

Acid Copper electroplating

松石科技
Pinestone

Acid Copper electroplating	Page
SPS	28
DPS	28
UPS	29
ZPS	29
NPE	29

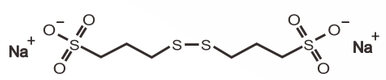
Electroplating intermediates

Acid Copper electroplating

SPS

chemical name: SPS/BIS-(SODIUM SULFOPROPYL)-DISULFIDE
Molecularformula: $C_6H_{12}Na_2O_6S_4$
Molecular weight: 354.4
CAS NO: 27206-35-5
Appearance: White to pale yellow solid powder
Assay: ≥98%

structure:



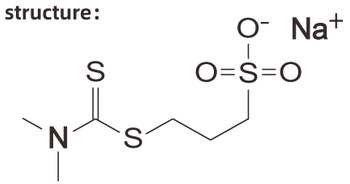
Application

SPS is applied in the production of electrolytic copper foil and is also used as a brightener in acidic copper plating. It can precipitate the growth of copper ions at the bottom between large grains, reduce the roughness, improve the physical properties, and inhibit the appearance of pinholes together with other additives. With the change of SPS concentration, the whole copper foil structure develops from cone to layer, changing the physical properties of copper foil, and SPS plays a leading role in the electrolytic process of double-sided lithium copper foil.

DPS

chemical name: N,N-dimethyl-dithiocarbamyl propyl sulfonic acid, sodium salt
Molecularformula: $C_6H_{14}NNaO_3S_3$
Molecular weight: 267.35
CAS NO: 18880-36-9
Appearance: White to pale yellow powder
Assay: ≥98%

structure:



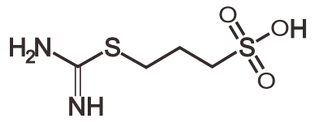
Application

DPS is used as brightening agent in acid copper electroplating baths and has, in combination withpolyethers and wetting agents, the effect of depositing a bright and ductile coating. A combination withother sulfur-containing brightening additives is also possible. For the chemical deposition of preciousmetals, DPS is used as a stabiizer to prevent wild deposition.

UPS

chemical name: **3-S-Isothiuronium propyl sulfonate**
Molecularformula: $C_4H_{10}N_2O_3S_2$
Molecular weight: **198.26**
CAS NO: **21668-81-5**
Appearance: **White to nearly white granules or powder**
Assay: **95%**

structure:



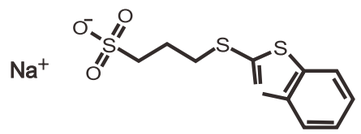
Application

UPS is used for the deposition of bright, ductile copper coatings incombination with polyethylene glycols and non-ionic surfactants. The employment of UPS isalso possible in other acid electroplating baths for silver and palladium deposition.

ZPS

chemical name: **3-(benzothiazolyl-2-mercapto)-propyl-sulfonic acid, sodium salt**
Molecularformula: $C_{10}H_{10}NNaO_3S_3$
Molecular weight: **311.38**
CAS NO: **49625-94-7**
Appearance: **White to pale yellow powder or crystals or powder**
Assay: **90%**

structure:



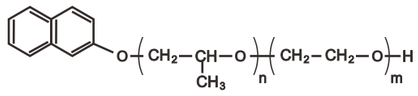
Application

ZPS is used as brightening agent in acid electroplating copper baths andhas, in combination withpolyethers and eting agents, the effect of depositing a bright andductile coating. A combination withother sulfur-containing brightening agents is also possible.For the chemical deposition of preciousmetals, ZPS is used as a stabilizer to prevent wilddeposition.ssible in other acid electroplating baths forsilver and palladium deposition.

NPE

chemical name: **Alkoxyliertes beta naphthol**
Molecularformula:
Molecular weight: **160.6**
CAS NO: **63950-87-8**
Appearance: **Yellow or brown viscous liquid**
PH(10% water solution) : **5.0-7.0**

structure:



Application

NPE is a carrier and non-ionic active agent for acid copper plating.It can improve the leveling power, especially at low current density.It is usually used inconjunction with polyether, sulfur-containing compound, polyammonium to getleveling,and the coating is glossy and ductile. The formula with NPE can be used in theproduction of printed circuit boards and other decorative purposes. It is often used in

松石科技
Pinestone

Electroless Copper plating

Electroless Copper plating	Page
Q75/EDTP	31
OPX	32

松石科技
Pinestone

Q75/EDTP

chemical name: **N,N,N',N'-Tetrakis(2-hydroxypropyl) ethylenediamine**

Molecularformula: **$C_{14}H_{32}N_2O_4$**

Molecular weight: **292.42**

CAS NO: **102-60-3**

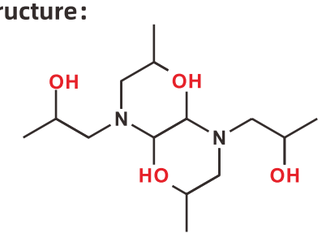
Appearance: **Colorless or pale yellow clear liquid**

Assay: **75%/99%**

Application

Q75 (EDTP) is readily soluble in water, and its aqueous solution is weakly alkaline. It is mainly used as complexing agent for electroless copper plating (PCB chemical copper deposition).

structure:



OPX

chemical name: **(O-Ethyldithiocarbonato)-S-(3-sulfopropyl)-ester,Kaliumsalz**

Molecularformula: **$C_6H_{13}KO_4S_3$**

Molecular weight: **284.44**

CAS NO: **93841-14-16**

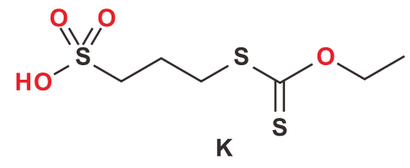
Appearance: **White to pale yellow crystalline powder**

Assay: **96%**

Application

OPX is sulfur-containing electroplating intermediate for acid copper plating. It serves as top brightener, usually compounded with SPS and polyether carrier brightener. It refines copper crystal grains, improves brightness and ductility of copper deposit, reduces internal stress and suppresses abnormal copper precipitation. Widely used in PCB, copper foil and hardware acid copper plating.

structure:



Intermediates for electrolyte of lithium ion battery

松石科技
Pinestone

Intermediates for electrolyte of lithium ion battery	Page
1.3-PS	35
1.4-BS	36
2.4-BS	36

Intermediates for electrolyte of lithium ion battery

松石科技 Pinestone

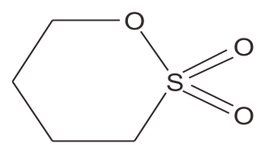
1.4-BS

chemical name:	**1,4-BUTANE SULTONE (1,4-BS)**
Molecularformula:	**$C_4H_8O_3S$**
Molecular weight:	**136.17**
CAS NO:	**1633-83-6**
Appearance:	**Transparent colorless to yellow liquid**
Assay:	**≥98% (industrial grade);**
	≥99% (electronic grade)

Application

1,4-BS is used in lithium battery additives, pharmaceutical intermediates, dye intermediates, pesticide intermediates, and other applications.1,4-BS is used to enhance battery cycle life and suppress gas generation.

structure:



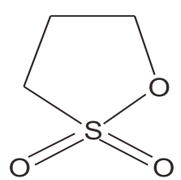
1.3-PS

chemical name:	**1,3-Propane Sultone**
Molecularformula:	**$C_3H_6O_3S$**
Molecular weight:	**122.14**
CAS NO:	**1120-71-4**
Appearance:	**Colorless to pale yellow liquid / crystal**
Assay:	**≥99%**

Application

Adding 1,3-PS to the non-aqueous electrolyte of lithium-ion batteries can improve the cycle life and storage stability of the batteries.

structure:



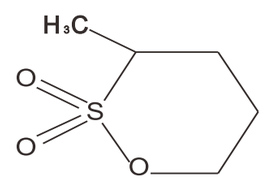
2.4-BS

chemical name:	**2,4-BUTANE SULTONE**
Molecularformula:	**$C_4H_8O_3S$**
Molecular weight:	**136.17**
CAS NO:	**1121-03-5**
Appearance:	**Colorless oily**
Assay:	**≥98%**

Application

2,4-BS is applied in various fields such as lithium battery additives, pharmaceutical intermediates, dye intermediates, and pesticide intermediates, and is suitable for use in high-temperature and high-pressure environments.

structure:



Materials for electroplating /others

Materials for electroplating /others 39

Materials for electroplating/others

Chemical Name	CAS NO.
2-(4-Chlorobenzyl)-benzimidazole	5468-66-6
2-Iodobenzoic Acid	88-67-5
2-Thio-Uracyle	141-90-2
3-Buten-1-0l	627-27-0
3-mercapto-1,2,4-triazole	3179-31-5
Ammonium chloride	125-02-9
Bariun Sulfonate	66455-19-4
Benzyl alcohol	100-51-6
Cerium Fluoride	7758-88-5
Chromium oxide	1308-38-9
Copper pyrophosphate	10102-90-6
EDTA-4Na	1964-2-8
Fluoboric acid	16872-11-0
Ft-248 50%	56773-42-3
Glycine	56-40-6
Hydroxylamine Sulfate	10039-54-0
Isopropanol	67-63-0
Malonic Acid	141-82-2
Manganese Carbonate	598-62-9
Methane disulfonic acid	503-40-2
Methanedisulfonic acid, dipotassium salt	6291-65-2
Methanedisulfonic acid,disodium salt	5799-70-2
Nicke chloride	7718-54-9
Nickel carbonate	3333-67-3
Nickel Sulfate	7786-81-4
Nonyl Phenol Ethoxylate	9016-45-9

Chemical Name	CAS NO.
P-anisaldehyde	123-11-5
Phytic acid	83-86-3
P-NitrobenzoicAcid	62-23-7
Polassium sodium tartrate	6381-59-5
Polyethylene Glycol	25322-68-3
Potassium chloride	7447-40-7
Potassium pyrophosphate	7320-34-5
Potassium thiocyanate	333-20-0
Potasslum Thiocyanate	333-20-0
Selenium dioxide	7446-8-4
Sodium 3-nitrobenzenesulphonate	127-68-4
Sodium benzoate	532-32-1
Sodium Bromide	7647-15-6
Sodium gluconate	527-07-1
Sodium Heptonate Dihydrate	13007-85-7
Sodium hypophosphite	7681-53-0
Sodium Hypophosphite	10039-56-2
Sodium metasilicate pentahydrate	10213-79-3
Sodium metaslicate	6834-92-0
Sodium Para Toluene Sulphinate	824-79-3
Sodium saccharine	3973-18-0
Sodium Xylene Sulfonate	300-72-7
Stannous chloride	10025-69-1
Stannous methanesulfonate	53408-94-912
Stannous sulfate	7488-55-3
Sulfamic Acid	5329-14-6