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Good Quality Comes From
Qualified Materials

REACH Approved

ECHA
EUROPEAN CHEMICALS AGENCY

SpecKare™ PO
(Piroctone Olamine)

Latest Regulation Compliant

Anti-dandruff

Anti-acne Agent

Function

Thickening

Anti-microbial, anti-acne

Anti-dandruff and relieve itches

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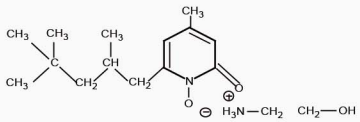
Product Name	SpecKare™ PO
Product Code	170012
INCI Name	Piroctone Olamine
CAS No.	68890-66-4
EINECS NO	272-574-2
Chemical Name	1-Hydroxy-4-methyl-6-(2,4,4-trimethylpentyl)-2-(1H)pyridinone, 2-aminoethanol salt(1:1)
Structural formula	

Physical and Chemical Properties

Items	Specification
Appearance	White crystalline powder
Odor	Characteristic
Solubility	Water (0.10g+10mL): non-soluble Methanol (1.00g+10mL): soluble
Purity(HPLC)	≥99.0%
pH(1% in water, 20℃)	8.5-10.0
Melting point	130-135℃
Loss on drying	≤0.3%
Ash (SO4)	≤0.2%
Particle size distribution	100mesh
E 1% (1 cm) at 317 nm expressed on dried substance	214-236
Ethanolamine	20.0-21.0%
Nitrosamine content (PPb)	≤50
Heavy metals (Pb,As,Cd,Co,Cr,Hg,Ni,Sb)	≤10 ppm
Hexane(GC)	≤300ppm
Ethyl acetate(GC)	≤5000ppm

Safety Tests

Mutagenicity, AMES test performed on Salmonella Typhimurium/Reverse Mutation Assay Strain: safe
Skin sensitization(0.5% SpecKare™ PO, nonirritating, OECD 439): safe
Eye irritation: 0.5%SpecKare™ PO—nonirritating (OECD 437 BOCP): safe

Regulation

Comply with regulations in EU and China, REACH registrtion

Stability

pH: stable in solution with pH3-9. condition of neutral, Pka:7.4
Heat: stable to heat, above 80℃ for a while. in shampoo of pH 5.5-7.0 stable after 1 year of storage at temperature over 40℃
Light: decompose under direct ultraviolet radiation
Metals: solution degrades in the presence of cupric and ferric ions
Viscosity: increase surfactant viscosity

Package

1kg/package, 25kg/package

Storage

Store at cool and dry place, protected from light.

Shelf life

3 years

Characters

Anti-dandruff function more effective than ZPT and Climbazole
Wide-spectrum anti-bacteria and anti-fungi
Good surfactant solubility and system thickening function
Safe and no irritation for scalp care

Thickness Increase Effect

Shampoo composition(8% AES, 4% AME-Mg, 3% AAB, water, 0.3-0.4% SpecKare™ PO)
Viscosity of shampoo is about 3000m.pas.
○ Simplifies production process
○ Raise product stability ○ Reduce product cost

Inhibit Malassezia, erase dandruff and itches from beginning

Malassezia grow in scalp growth, leading to generation of dandruff. Experiments have confirmed that SpecKare™ PO can inhibit the growth of Malassezia through anti-bacterial effect to block channels of dandruff generation, effectively inhibiting dandruff.

Bacteriostatic Effect Test on Malassezia

Sample Name	Concentration (mass ratio)								
	5%	3%	1%	0.5%	0.3%	0.2%	0.1%	0.08%	0.06%
SpecKare™ PO	+ + +	+ + +	+ + +	+ + +	+ + +	+ +	+	-	-

Annotate: +++ very obvious anti-bacterial effect ++ obvious anti-bacterial effect + anti-bacterial effect - no anti-bacterial effect

Reference:
Test Report on 6th, July, 2018: Minimum Inhibitory Concentration on Malassezia of SpecKare™ PO
Spec-Chem Application Research Center

Antimicrobial Effect

Microorganisms	MIC (mg/L)
Bacteria	
Aerobic	
Staphybcoccus aureus	6.25
Staphylococcus epidermidis	6.25
Escherichia Coli	12.5
Fungi	
Cutameous fungi	
Trichophyton rubrum	6.25
T. mentagrophytes	12.5
Microsporum canis	12.5
Epidermophyton floccosum	6.25
Candida	
Candida albicans	25
Candida tropicalis	25
Malassezia furfur	12.5

Result: MIC of SpecKare™ PO to 11 kinds of microorganisms between 6.25 and 25mg/L

It has been proved SpecKare™ PO can inhibit Propionibacterium acnes.

Application

Innovative Hair Care & Skin Care
Shampoo(anti-dandruff, transparent type),
Conditioner(rinse-off, leave-on), Hair Spray etc.
Anti-acne repair lotion, skin restoration cream, mask etc.

Use Level

Shampoo, Conditioner 0.3-1%
Anti-dandruff spray 0.3-0.5%
Anti-dandruff hair keep 0.1-0.8%
Anti-dandruff fixing agent 0.05-0.2%
Anti-dandruff hair emulsion 0.1-0.3%
Anti-dandruff hair supporting 0.05-0.1%
Anti-acne repair cream, mask 0.05-0.5%
Soap 0.2-0.5%
Preservative 0.2-0.5%
Deodorants 0.1-0.3%

Formulation Guide
Compatibility

Compatible with most surfactants, additives and active ingredients used in cosmetics. Can be combined with most cationic surfactants (quaternary ammonium compounds) and cationic active ingredients

Can be used with the aldehyde and ketone and flavoring under 0.5% dosage.
Copper and iron changes color of shampoo with SpecKare™ PO to yellow without any change in efficacy.
When formulate, add last phase below 60℃ with deionized water, no heavy metals, pigment can cover yellow color.

Solubility

Freely soluble in 10% ethanol in water; soluble in solution containing surfactants in water or in 1%-10% ethanol; slightly soluble in water (0.05%)and in oil(0.05%-0.1%).
The solubility in water varies by pH value, and is a litter larger in neutral or weak basic solution than in acid solution.

Hair Conditioner

Ingredients		(%)
Oil phase	octadecyl alcohol	6.0
	Docosyltrimethylammonium chloride	1.0
Oil phase	TC-1214 （100cst）	1.5
	TC-1233	1.5
Water phase	Glycine	3.0
	HEC	0.5
	TC-POLYQUAT 200L	0.3
	Aqua	To 100
SpecKare™ PO		0.3
Preservative		Q.S
Essence		Q.S

Operation process

1.Oil phase ingredients (except TC-1214 TC-1233) was heated to 75℃.
2.TC-POLYQUAT 200L, HEC heated to 70-75℃.
3.When the water phase is heated to 70-75℃, under stirring to emulsify , oil phase was added to the pot.
4.cooling down to 55-60℃, TC-1214 and TC-1233 emulsifying and homogeneous three minutes.
5.continue to cool 40-45℃, add SpecKare™ PO, preservatives and flavors, stirring 10-15 minutes .

Anti-dandruff clear shampoo

Ingredients	(%)
Aqua	To 100
EDTA-2Na	0.10
AESA （70%）	8
K12A(70%)	8
TC-8025	5
TC-14-S	0.15
Cetearyl alcohol	0.5
Pearling agent	1.0
CMEA	1
TC-23	0.5
TC-SHD	3
CAB-35	2
TC-1352	2
Kathon	0.05
SpecKare™ PO	0.5
Citric acid	pH(6.0-6.2)
Essence	Q.S

Operation process

1. Disperse TC-14-S in water
2. Add TC-8025 to water, add EDTA-2Na
3. AESA, K12A oin pot, heated to 75-80℃
4. Heat pearling agent, CMEA, cetostearyl alcohol to 80℃, stir and mix for 15-20 minutes
5. Cool to 50℃, add TC-1352 silicone emulsion, TC-SHD, CAB-35
6. Disperse SpecKare™ PO with deionized water, add to the system
7. Stir with citric acid, adjust pH;

* Contact for more formulation consults, test reports and technical communications.