CUPRABIO PEPTIDES | TECHNICAL DATA SHEET (TDS)

GHK-Cu (Copper Tripeptide-1) Powder

Cosmetic Active Raw Material · Acetate (CAS 49557-75-7) & Free Base (CAS 89030-95-5) · HPLC >=98.0% / >=99.0%

Document ID: CB-TDS-GHKCU-2026
Revision: 2026.11 (v2.0)
INCI: Copper Tripeptide-1
Web: cuprabio.com

1. Chemical & Regulatory Identity

INCI Name	Copper Tripeptide-1	**Amino Acid Sequence**	Gly-L-His-L-Lys · Cu^{2+}
CAS Number (Acetate)	49557-75-7 (Stoichiometric Acetate)	**CAS Number (Free Base)**	89030-95-5 (Anhydrous / Free Base)
Molecular Formula	C14H22CuN6O4 (Free Base moiety)	**Molecular Weight**	403.9 g/mol (Free Base) / ~463.9 g/mol (Acetate)
EC / EINECS No.	618-276-8	**Physical Appearance**	Dark blue to violet-blue crystalline powder
Aqueous Solubility	>= 100 mg/mL in deionized water (clear blue solution)	**Intended Use**	Topical cosmetic & personal-care formulations only

2. Quality Specifications by Grade & Form (Batch COA Verified)

Test Parameter	Analytical Method	Standard Grade (>=98%)	High-Purity Grade (>=99%)	Typical Batch Result
Peptide Purity (RP-HPLC)	RP-HPLC (C18, 220 nm)	>= 98.0%	>= 99.0%	99.4% – 99.9%
Single Max Impurity	RP-HPLC Area %	<= 1.0%	<= 0.5%	0.12%
Copper Content (Cu^{2+})	ICP-OES / Titration	10.0% – 16.0%	13.0% – 16.0%	13.8% – 14.7%
Water Content (Moisture)	Karl Fischer (USP <921>)	<= 5.0%	<= 5.0%	1.5% – 2.6%
Acetic Acid (Acetate Form)	HPLC / Ion Chromatography	<= 15.0% (or <=2.5% Low-Ac)	<= 12.0% (Free base: <=0.5%)	9.5% (Ac) / 0.04% (FB)
pH (2 mg/mL in H2O, 25°C)	Potentiometric pH Meter	5.5 – 7.5	5.5 – 7.5	6.1 – 6.5
Heavy Metals (Total as Pb)	USP <231> / ICP-MS	<= 10 ppm	<= 10 ppm (As <=1ppm, Pb <=2ppm)	Complies (< 5 ppm)
Residual Solvents	GC Headspace (ICH Q3C)	Complies with ICH Q3C	Complies with ICH Q3C	Not detected
Total Aerobic Microbial Count	USP <61> / ISO 21149	<= 100 CFU/g	<= 100 CFU/g	< 10 CFU/g

3. Cosmetic Formulation Guidelines & Incompatibility Matrix

Formulation Parameter	Recommended Operating Window	Critical Technical Precaution for Formulators
Recommended Dosage	0.05% – 0.20% w/w (Daily Serum) 0.20% – 0.50% w/w (Intensive Ampoule)	1.0 g of GHK-Cu per 1 kg batch equals 0.10% w/w (~140 ppm elemental Cu^{2+}). Can also be pre-dissolved as a 1.0% aqueous stock solution.
Target Formula pH	pH 5.5 – 7.5 (Optimal: 6.0 – 6.8)	Below pH 5.0, the imidazole ring of L-Histidine protonates, breaking the Cu^{2+} coordination bond and shifting color from violet-blue to pale green.
Addition Temperature	Cold-process or cool-down phase (< 40°C)	Dissolve GHK-Cu in deionized water at room temperature (20–30°C) and add during the final cool-down stage below 40°C with gentle mixing.
Chelating Agents	AVOID Disodium EDTA / Tetrasodium EDTA	Strong chelators (EDTA, Phytic Acid >0.2%, Caprylhydroxamic Acid) have higher stability constants for Cu^{2+} and strip copper from the tripeptide.
Acids & Antioxidants	AVOID L-Ascorbic Acid & low-pH AHAs/BHAs	L-Ascorbic acid reduces Cu^{2+} to Cu^{+} causing precipitation; glycolic/lactic/salicylic acids (< pH 4.5) destabilize the copper-peptide complex.
Gelling & Rheology Agents	Use HEC, Xanthan, Sclerotium, Sepimax ZEN	Avoid unneutralized traditional Carbomers (Acrylates), which cross-link or collapse in the presence of divalent Cu^{2+} ions.

4. Packaging, Storage & Shelf Life

Standard Packaging: 10 g / 50 g / 100 g / 1 kg light-blocked sealed bottles or aluminum-foil pouches; 5 kg aluminum-foil bags; 25 kg export fiber drums with double PE inner liners and desiccant. **Storage Conditions:** Store tightly sealed in a dry, dark environment at **2–8 °C** for warehouse storage (or **-20 °C** for multi-year retention). Room-temperature air express transit (5–10 days) is fully supported. **Shelf Life:** 24 months in original unopened container.

CupraBio Peptides · Xi'an Tuoheng Huanyu International Trade Co., Ltd. | Room 1604, Anhui Building, North Taihua Road, Weiyang District, Xi'an, Shaanxi, China | Email: info@cuprabio.com | WhatsApp: +86 189 9282 1528 | Web: https://cuprabio.com

Regulatory Disclaimer: GHK-Cu (Copper Tripeptide-1) is supplied strictly as a raw material for topical cosmetic and personal-care formulations and laboratory R&D.; Not for drug, injectable, or food use.