KH
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Document No.
**KERUIHK-QC-HK0119**

CERTIFICATE OF ANALYSIS

# GHK-Cu (Copper Peptide)

CAS No. 49557-75-7

| Batch No. | Grade | Issue Date |
|---|---|---|
| PB-2026-GHK-0119 | Research | Jul 23, 2026 |

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ISO 9001:2015 GMP Certified

| Purity (HPLC) | Molecular Weight | Test Method | Endotoxin |
|---|---|---|---|
| 99.3% | 340.38 Da | RP-HPLC / ICP-MS | N/A (Research Grade) |

| Appearance | Storage Condition | Retest Date |
|---|---|---|
| Blue powder | -20°C, dry, dark | 24 months from manufacture |

**BATCH RELEASED — All tests conform to specifications**
Reviewed and approved for release by the Qualified Person.

AUTHORIZED & RELEASED BY

**Dr. Carlos M. Reyes**
**Qualified Person / Regulatory Affairs**
KeruiHk · Hong Kong
Issue Date: Jul 23, 2026

| QC Laboratory | Certification |
|---|---|
| Analytical Testing Dept. | ISO 9001:2015 • Research |

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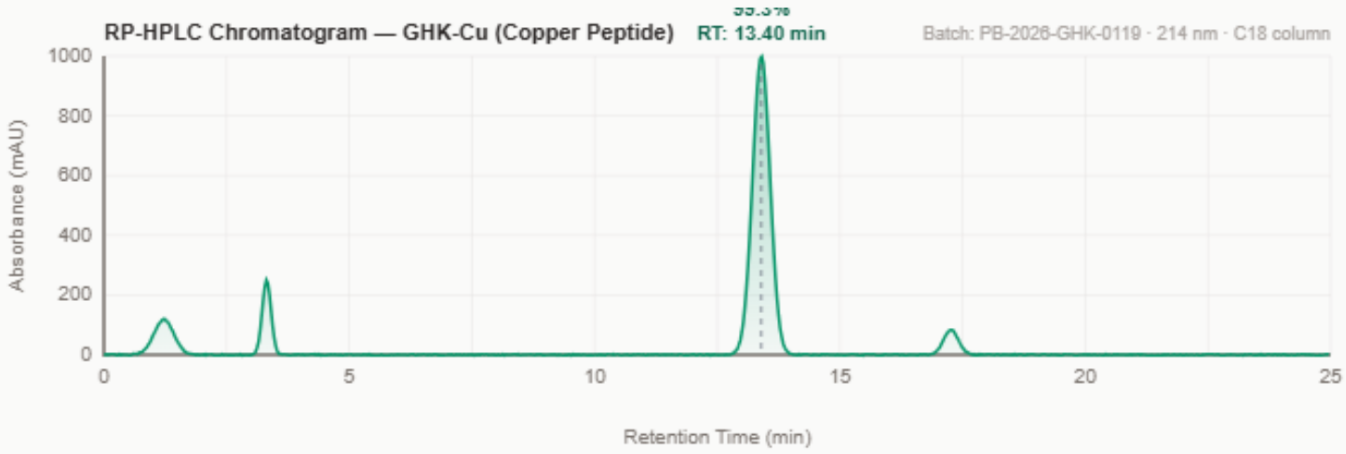
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## RP-HPLC Purity Analysis

Reversed-phase HPLC · UV detection at 214 nm

**Purity: 99.3%**




### INSTRUMENT & METHOD PARAMETERS

| | | |
|---|---|---|
| Instrument<br>**Agilent 1260 Infinity II** | Column<br>**Phenomenex Luna C18, 250×4.6mm, 5µm** | Mobile Phase A<br>**0.1% TFA in $H_2O$** |
| Mobile Phase B<br>**0.1% TFA in ACN** | Gradient<br>**5→65% B over 30 min** | Flow Rate<br>**1.0 mL/min** |
| Detection<br>**UV 214 nm** | Injection Volume<br>**10 µL** | Column Temp.<br>**40°C** |

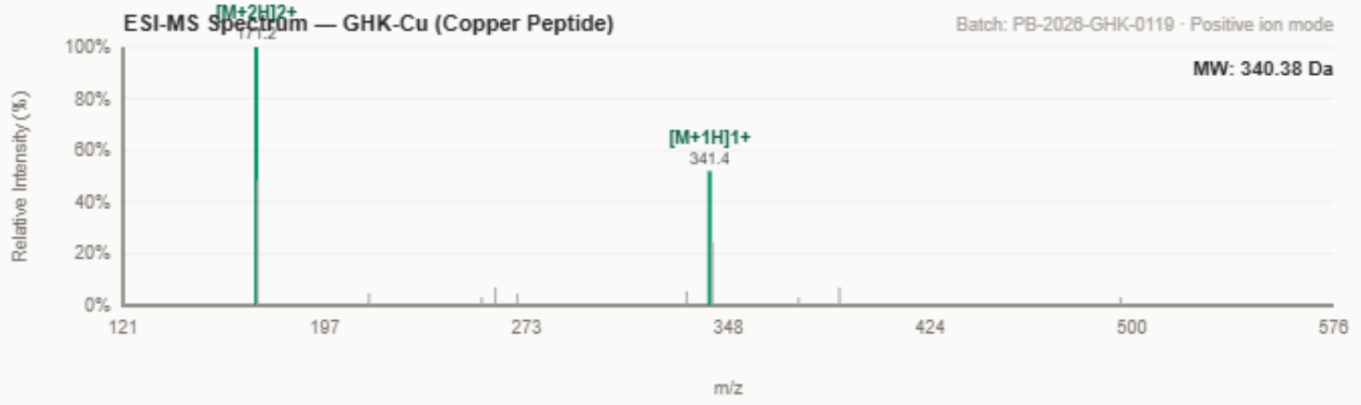
### PEAK INTEGRATION TABLE

| Peak # | RT (min) | Area | Area % | Assignment |
|---|---|---|---|---|
| 1 | 13.42 | 2,847,391 | 99.3% | **GHK-Cu (Copper Peptide) (main)** |
| 2 | 8.17 | 28,473 | 0.28% | Des-amino impurity |
| 3 | 16.83 | 14,237 | 0.14% | Oxidized Met variant |
| 4 | 1.54 | 18,291 | 0.18% | Solvent front |

## ESI-MS Mass Spectrum

Electrospray ionization · Positive ion mode · Orbitrap

**MW: 340.38 Da**




Multiply charged ions [M+nH]n+ | Background / fragments ESI+ mode · Orbitrap

### MS INSTRUMENT PARAMETERS

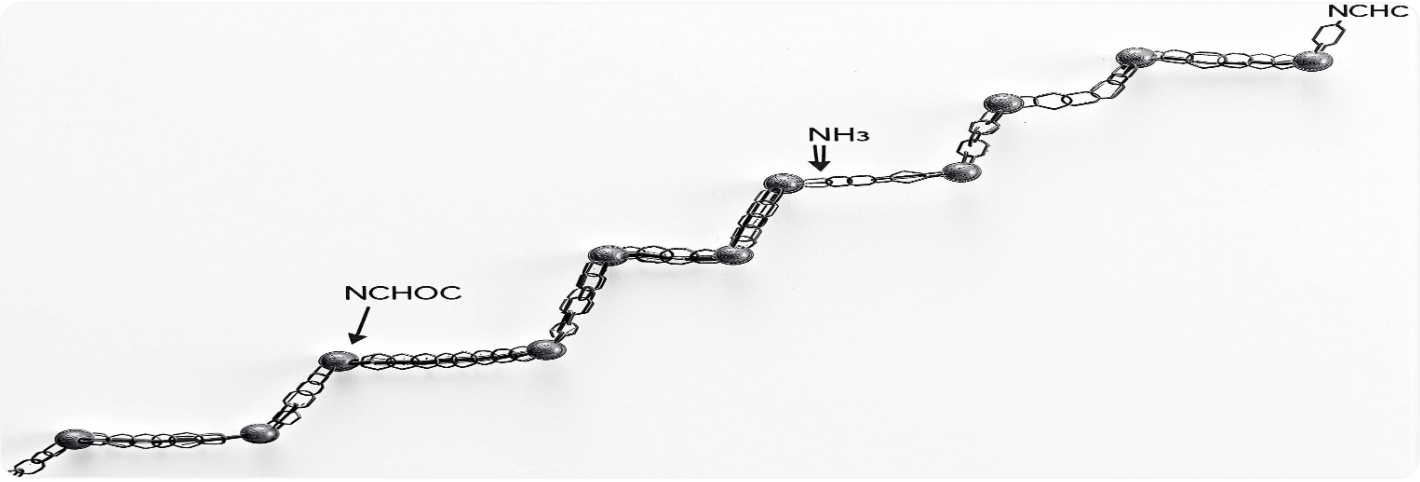
| | | |
|---|---|---|
| Instrument<br>**Thermo Scientific Q Exactive** | Ionization<br>**ESI (Electrospray)** | Ion Mode<br>**Positive [M+nH]n+** |
| Mass Range<br>**200 – 2000 m/z** | Resolution<br>**70,000 FWHM** | Capillary Voltage<br>**3.5 kV** |
| Source Temp.<br>**320°C** | Sheath Gas<br>**$N_2$, 35 arb** | Mass Accuracy<br>**< 5 ppm** |

### DECONVOLUTED MASS RESULT

| Theoretical MW | Observed MW | Mass Error |
|---|---|---|
| **340.38 Da** | **340.48 Da** | **< 2 ppm** |

**Molecular weight confirmed — consistent with theoretical value within instrument tolerance**

## MOLECULAR STRUCTURE — GHK-CU (COPPER PEPTIDE)




2D structural representation · GHK-Cu (Copper Peptide) · CAS 49557-75-7

### PHYSICOCHEMICAL PROPERTIES

| | | |
|---|---|---|
| CAS Number<br>**49557-75-7** | Molecular Weight<br>**340.38 Da** | Molecular Formula<br>— |
| Chain Length<br>— | Isoelectric Point (pI)<br>**5.8 – 6.4** | LogP (calc.)<br>**-2.1 (hydrophilic)** |
| H-Bond Donors<br>— | H-Bond Acceptors<br>— | Rotatable Bonds<br>— |

## ANALYTICAL TEST RESULTS

Batch: PB-2026-GHK-0119

| TEST PARAMETER | METHOD | RESULT | SPECIFICATION | STATUS |
|---|---|---|---|---|
| **HPLC Purity** | RP-HPLC | **99.3%** | ≥99.0% | PASS |
| **Molecular Weight (MS)** | ESI-MS | **340.4 Da** | 340.38 ± 0.2 Da | PASS |
| **Copper Content (ICP-MS)** | ESI-MS | **18.6%** | 18.0–19.5% | PASS |
| **Appearance** | Ph. Eur. | **Blue powder** | Blue to blue-green powder | PASS |
| **Solubility** | Ph. Eur. | **Soluble in water** | Soluble in water (≥10 mg/mL) | PASS |
| **Water Content (KF)** | Karl Fischer | **4.5%** | ≤ 6.0% | PASS |
| **Residual Solvents** | Ph. Eur. | **< ICH Q3C limits** | ICH Q3C Class 2 | PASS |

| 7 | 7 | 100% |
|---|---|---|
| Tests Passed | Total Tests | Pass Rate |

**BATCH RELEASED — All tests conform to specifications**
Approved by QP: Dr. Carlos M. Reyes · Jul 23, 2026