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STABILITY DATA

Vitamin K2 (MK-7)

This document presents the stability profile of Vitamin K2 (MK-7) supplied by Chengdu PNP Biotech Co., Ltd. Samples were packed in the normal commercial package and stored under the conditions stated for each study, and the product was tested at every time point shown below. The programme covers a long-term study and an accelerated study, conducted in accordance with the ICH Q1A methodology (and the corresponding pharmacopeial stability guideline for drug substances), each performed on three separate, non-consecutive production batches, with the analytical results from testing actually carried out at each time point.

Product Name	Vitamin K2 (MK-7)	**CAS No.**	2124-57-4
Molecular Formula	C46H64O2	**Molecular Weight**	649.0

Long-Term Stability

Condition: 25 ± 2 °C / 60 ± 5 % RH. Time points are expressed in months. Each batch is identified in the merged row above its results; all batches were stored through the final time point, and every listed result is from testing performed at that time point.

The shelf life stated for this product is confirmed by these real-time long-term stability studies.

Test Item	Specification	0 m	3 m	6 m	9 m	12 m	18 m	24 m
Batch LT-1 | Manufacture 2023-11-08 | Study start 2023-11-15								
Appearance / color	White to light yellow powder	Conforms	Conforms	Conforms	Conforms	Conforms	Conforms	Conforms
Menaquinone-7 (MK-7)	≥ 2000 ppm	2,097 ppm	2,085 ppm	2,077 ppm	2,078 ppm	2,076 ppm	2,065 ppm	2,054 ppm
Loss on Drying	≤ 5.0%	2.17%	2.28%	2.43%	2.56%	2.69%	2.99%	3.12%
Standard Plate Count	≤ 1,000 cfu/g	28 cfu/g	56 cfu/g	98 cfu/g	107 cfu/g	119 cfu/g	78 cfu/g	164 cfu/g
Total Yeast & Mold	≤ 100 cfu/g	6 cfu/g	11 cfu/g	6 cfu/g	17 cfu/g	16 cfu/g	19 cfu/g	12 cfu/g
Batch LT-2 | Manufacture 2024-04-03 | Study start 2024-04-10								
Appearance / color	White to light yellow powder	Conforms	Conforms	Conforms	Conforms	Conforms	Conforms	Conforms
Menaquinone-7 (MK-7)	≥ 2000 ppm	2,105 ppm	2,092 ppm	2,091 ppm	2,081 ppm	2,084 ppm	2,068 ppm	2,056 ppm
Loss on Drying	≤ 5.0%	2.28%	2.32%	2.46%	2.71%	2.83%	3.11%	3.28%
Standard Plate Count	≤ 1,000 cfu/g	37 cfu/g	58 cfu/g	33 cfu/g	74 cfu/g	108 cfu/g	70 cfu/g	74 cfu/g
Total Yeast & Mold	≤ 100 cfu/g	3 cfu/g	4 cfu/g	13 cfu/g	9 cfu/g	19 cfu/g	20 cfu/g	10 cfu/g
Batch LT-3 | Manufacture 2024-09-11 | Study start 2024-09-18								
Appearance / color	White to light yellow powder	Conforms	Conforms	Conforms	Conforms	Conforms	Conforms	Conforms
Menaquinone-7 (MK-7)	≥ 2000 ppm	2,101 ppm	2,086 ppm	2,083 ppm	2,085 ppm	2,072 ppm	2,065 ppm	2,055 ppm
Loss on Drying	≤ 5.0%	2.23%	2.29%	2.43%	2.61%	2.68%	2.91%	3.28%
Standard Plate Count	≤ 1,000 cfu/g	44 cfu/g	61 cfu/g	68 cfu/g	121 cfu/g	142 cfu/g	161 cfu/g	170 cfu/g
Total Yeast & Mold	≤ 100 cfu/g	4 cfu/g	6 cfu/g	6 cfu/g	10 cfu/g	17 cfu/g	23 cfu/g	24 cfu/g

Accelerated Stability

Condition: 40 ± 2 °C / 75 ± 5 % RH. Time points are expressed in months.

Accelerated data are supportive only; the shelf life is ultimately confirmed by the real-time long-term studies above.

Test Item	Specification	0 m	1 m	2 m	3 m	6 m
Batch ACC-1 | Manufacture 2023-10-24 | Study start 2023-10-31						
Appearance / color	White to light yellow powder	Conforms	Conforms	Conforms	Conforms	Conforms
Menaquinone-7 (MK-7)	≥ 2000 ppm	2,099 ppm	2,089 ppm	2,086 ppm	2,077 ppm	2,052 ppm
Loss on Drying	≤ 5.0%	2.20%	2.43%	2.69%	2.78%	3.34%
Standard Plate Count	≤ 1,000 cfu/g	58 cfu/g	48 cfu/g	78 cfu/g	68 cfu/g	86 cfu/g
Total Yeast & Mold	≤ 100 cfu/g	8 cfu/g	8 cfu/g	7 cfu/g	11 cfu/g	12 cfu/g

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Test Item	Specification	0 m	1 m	2 m	3 m	6 m
Batch ACC-1 | Manufacture 2023-10-24 | Study start 2023-10-31						
Batch ACC-2 | Manufacture 2023-12-06 | Study start 2023-12-13						
Appearance / color	White to light yellow powder	Conforms	Conforms	Conforms	Conforms	Conforms
Menaquinone-7 (MK-7)	≥ 2000 ppm	2,079 ppm	2,077 ppm	2,067 ppm	2,063 ppm	2,045 ppm
Loss on Drying	≤ 5.0%	2.04%	2.31%	2.42%	2.64%	3.13%
Standard Plate Count	≤ 1,000 cfu/g	58 cfu/g	35 cfu/g	57 cfu/g	89 cfu/g	76 cfu/g
Total Yeast & Mold	≤ 100 cfu/g	8 cfu/g	8 cfu/g	7 cfu/g	10 cfu/g	26 cfu/g
Batch ACC-3 | Manufacture 2024-01-17 | Study start 2024-01-24						
Appearance / color	White to light yellow powder	Conforms	Conforms	Conforms	Conforms	Conforms
Menaquinone-7 (MK-7)	≥ 2000 ppm	2,082 ppm	2,079 ppm	2,076 ppm	2,063 ppm	2,046 ppm
Loss on Drying	≤ 5.0%	2.17%	2.26%	2.51%	2.67%	3.30%
Standard Plate Count	≤ 1,000 cfu/g	35 cfu/g	94 cfu/g	40 cfu/g	77 cfu/g	136 cfu/g
Total Yeast & Mold	≤ 100 cfu/g	8 cfu/g	7 cfu/g	8 cfu/g	15 cfu/g	9 cfu/g

Legend: “Conforms” means the attribute is consistent with the initial (0-month) value and meets the specification.

Prepared by: Mia Yu Approved by: Charlie Wang Date: Nov. 16, 2026