



Vitaquinone
The new solvent free vit. K2

Our „single peak” definition

- 1 Vitaquinone
is a single peak.
- ↓
- 2 Vitaquinone is better
than USP reference.
- ↓
- 3 Vitaquinone
is super stable.
- ↓
- 4 Vitamin K2 taken from
the market shelf.

Vitaquinone is a single peak.



Vitaquinone®, Vitamin K2 as all-trans MK-7 is the purest vitamin available in the market: with validated isomeric purity of 100% according to US Pharmacopeia, produced by Vitasynth in its own European manufacturing site through a patented manufacturing and purification processes. Now also available in US in the organic form.

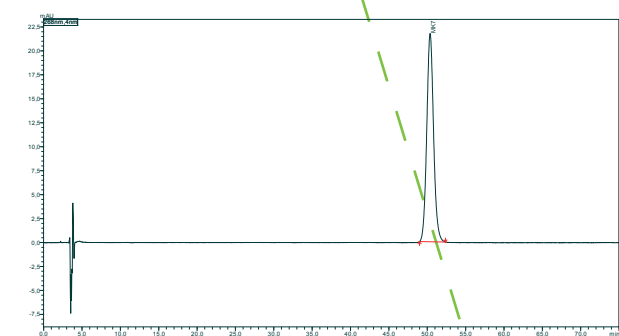
Compare
results
of both
methods.

Lot #API2203-1

This lot is a single peak both when tested with USP method and our own UPLC method.

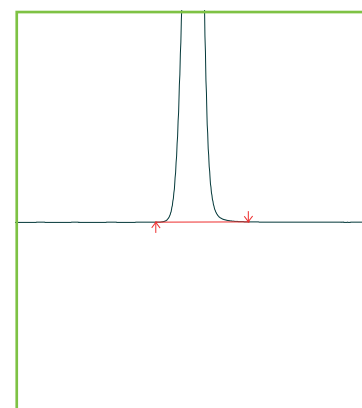
Isomeric purity <USP method>

Total impurities/Content of cis-menaquinone



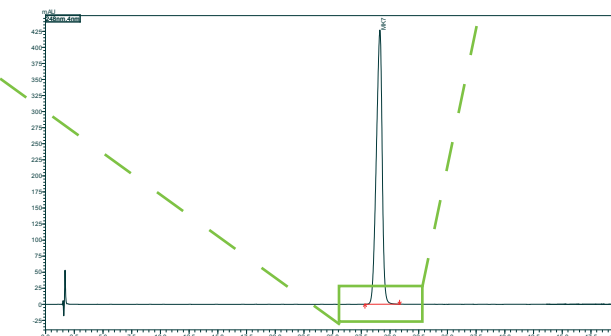
Peak#	Name	Ret. Time	Area	Area%
1	MK7	50.368	1339019	100.00
Total			1339019	100.00

Zoom in
to observe
the peak
in detail.



Related substances <UPLC method>

Total impurities



Peak#	Name	Ret. Time	Area	Area%
1	MK7	29.120	15145648	100.00
Total			15145648	100.00



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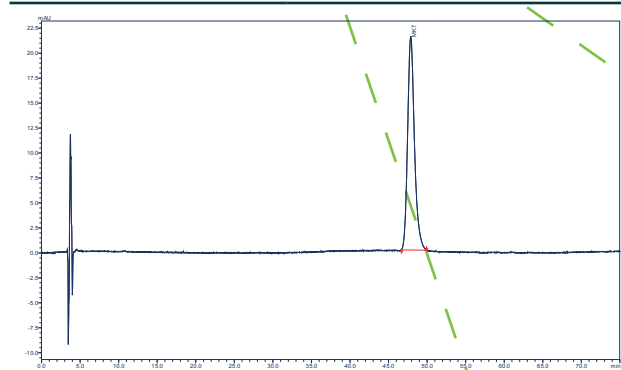
Compare results of both methods.

Lot #API2311-1

Another example of our production batch. Vitaquinone in purely all-trans.

Isomeric purity <USP method>

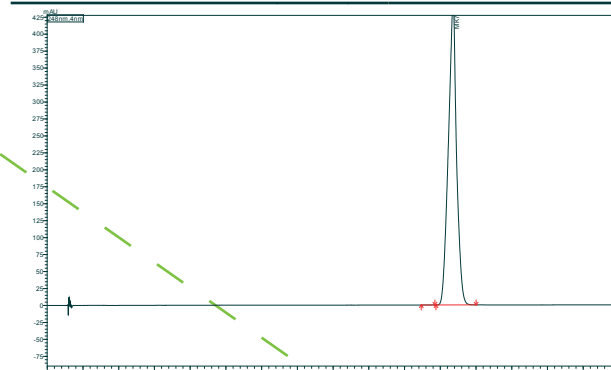
Total impurities/Content of cis-menaquinone



Peak#	Name	Ret. Time	Area	Area%
1	MK7	47.880	1357282	100.00
Total			1357282	100.00

Related substances <UPLC method>

Total impurities



Peak#	Name	Ret. Time	Area	Area%
1		26.631	3859	0.022 (<LOQ)
2	MK7	28.400	17794278	99.978
Total			17798137	100.00

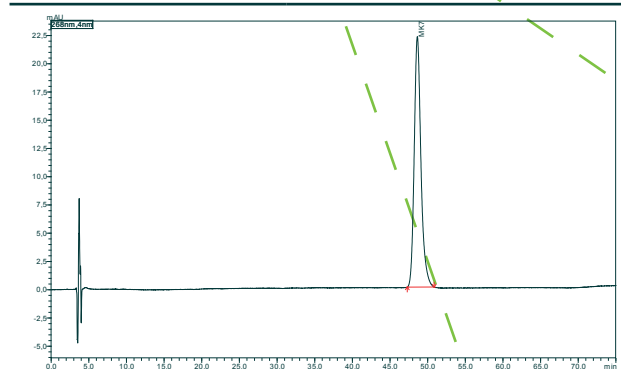
Compare results of both methods.

Lot #API2304-2

Last batch to demonstrate repeatability of our production and purification technology.

Isomeric purity <USP method>

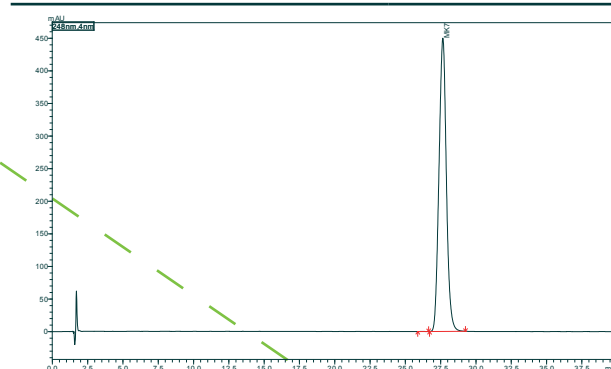
Total impurities/Content of cis-menaquinone



Peak#	Name	Ret. Time	Area	Area%
1	MK7	48.625	1378989	100.00
Total			1378989	100.00

Related substances <UPLC method>

Total impurities



Peak#	Name	Ret. Time	Area	Area%
1		29.120	3474	0.021 (<LOQ)
2	MK7	27.656	16352753	99.979
Total			16356217	100.00

Vitaquinone is better than USP reference.



We have tested USP Vitamin K2 (trans-MK7) method standard production lot #R142WO. The sample was noticeably less pure than our 3 regular production lots presented in the section above. You can also notice that USP method (left graph) is not selective enough to detect one impurity before the main peak.

Compare results of both methods.

USP method standard
Lot #R142WO

Tested:

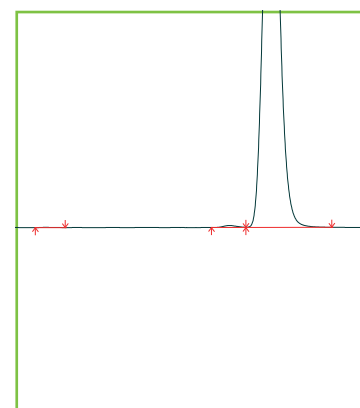
UPLC method - 18.08.2023

USP method - 18.08.2023

Sample validity period:
in force.

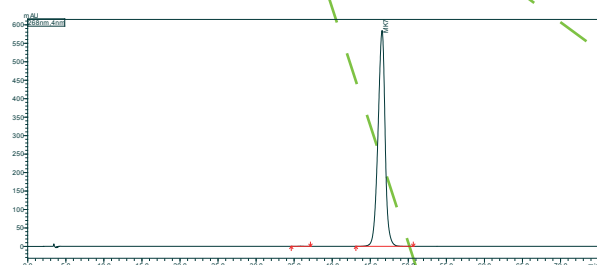
Compare USP method (left)
with UPLC method (right).
USP method can't detect all
impurities.

Zoom in
to observe
the peak
in detail.



Isomeric purity <USP method>

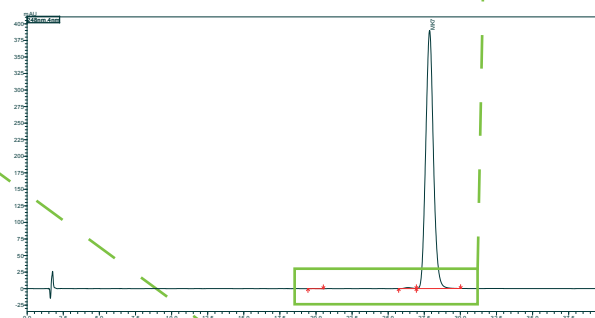
Total impurities/Content of cis-menaquinone



Peak#	Name	Ret. Time	Area	Area%
1		35.852	21246	0.056
2	MK7	46.551	37982879	99.944
Total			38004125	100.00

Related substances <UPLC method>

Total impurities



Peak#	Name	Ret. Time	Area	Area%
1		19.854	4992	0.034
2		26.369	51090	0.353
3	MK7	27.868	14429976	99.613
Total			14486058	100.00



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Vitaquinone is better than USP reference.



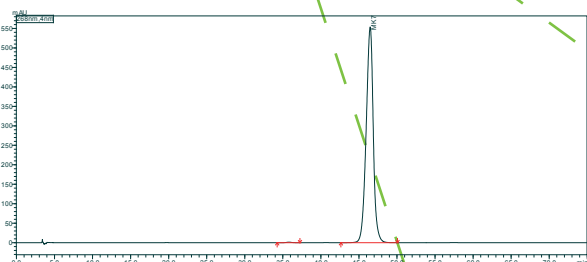
The quality of our standard production batches regularly surpass the official USP method standard in purity and assay. Therefore we believe Vitaquinone most likely surpasses all other vitamins K2 on the market.

Compare results of both methods.

USP method standard
Lot #R080L0
Tested:
UPLC method - 18.02.2021
USP method - 18.08.2023
Sample validity period:
May 2023.
Another sample of the official standard to prove repeatability of our test.

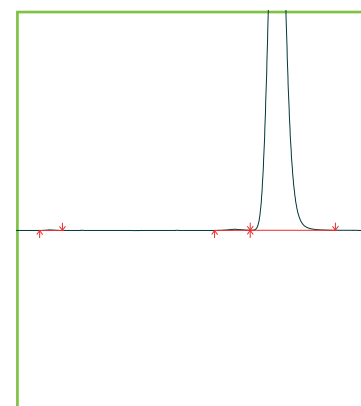
Isomeric purity <USP method>

Total impurities/Content of cis-menaquinone



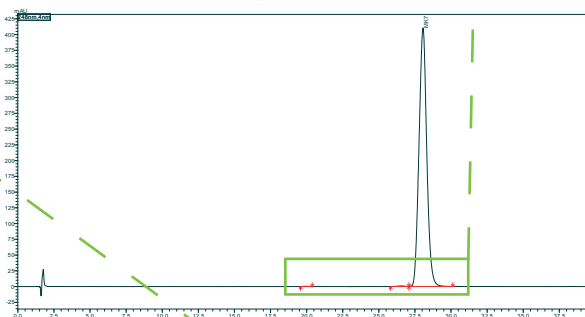
Peak#	Name	Ret. Time	Area	Area%
1		35.796	63755	0.177
2	MK7	46.480	35930703	99.823
Total			35994458	100.00

Zoom in to observe the peak in detail.



Related substances <UPLC method>

Total impurities



Peak#	Name	Ret. Time	Area	Area%
1		19.925	9284	0.061
2		26.528	28255	0.184
3	MK7	28.058	15286272	99.755
Total			15323812	100.00

Vitaquinone is super stable.



Vitaquinone doesn't degrade during shelf life.
Vitaquinone remains a single peak.

It was surprising even to us to see that our Vitaquinone 5% Organic MCT oil K2 solution is still single peak after 30 months of production.

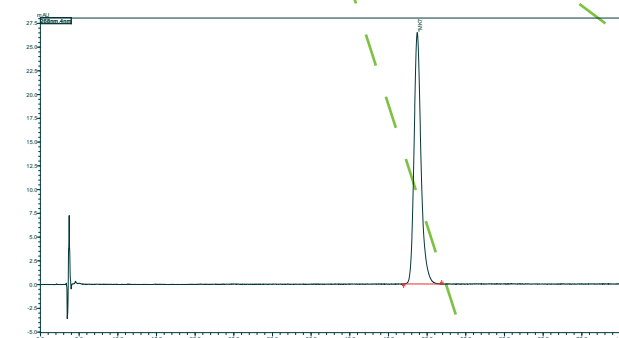


Organic
5% MCT
oil

**Vitaquinone 5% Organic
MCT oil**
Lot #500L2101-1
Testing period: 30th month
after the production
Storage condition: 25°C ± 2°C
/ 60% RH ± 5% RH

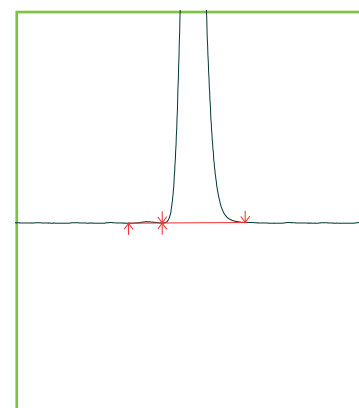
Isomeric purity <USP method>

Content of cis-menaquinone-7



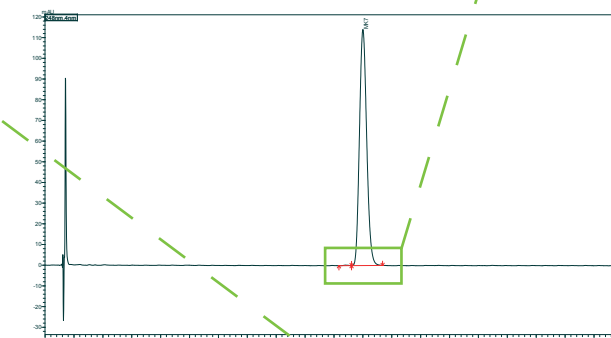
Peak#	Name	Ret. Time	Area	Area%
1	MK7	48.718	1671333	100.00
Total			1671333	100.00

Zoom in
to observe
the peak
in detail.



Related substances <UPLC method>

Total impurities



Peak#	Name	Ret. Time	Area	Area%
1		26.005	6987	0.140
2	MK7	27.499	4966862	99.860
Total			4973849	100.00



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Vitamin K2 taken from the market shelf – brand A



This brand is owned a dynamic, ambitions direct sales company. They neither have their own production nor own lab, but they have high ambitious to conquer the online K2 supplement market.

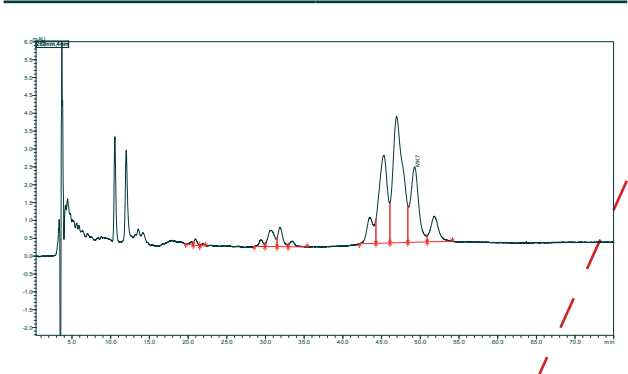
Their product packages are premium, labels are neat, but their consumers consume mostly unknown impurities.

Compare results of both methods.

Brand A
Batch numer #9D3K2023
This market „wannabe” took the cheapest Vitamin K2 and combined it with Calcium.

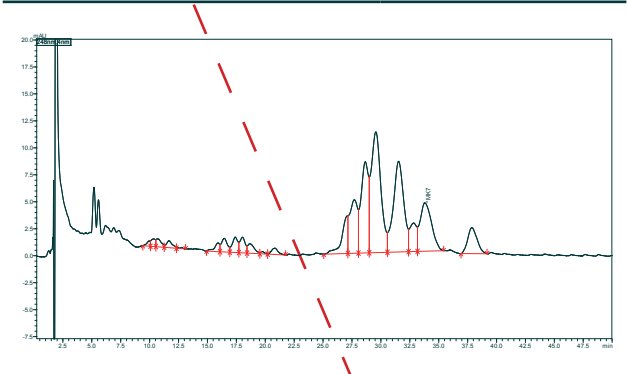
The result is more than 80% of unknowns.

Isomeric purity <USP method> Total impurities



Peak#	Name	Area%
1	MK7	18.817
Total impurities *		81.183

Related substances <UPLC method> Total impurities



Peak#	Name	Area%
1	MK7	11.163
Total impurities *		88.837

* - Total impurities were taken as a sum of area % of all marked impurities

Vitamin K2 taken from the market shelf – brand B



This brand is the local market leader in pharmacy sales according to IQVia. Sales are huge and the owners know that pushing COGs down is the safest strategy to keep the market share.

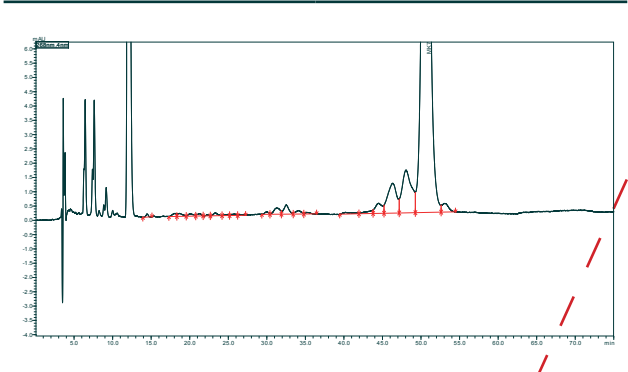
However, to consume these impurities is not the safest strategy for the unaware clients of that brand.

Compare results of both methods.

Brand B
Batch number #21019
A simple product – drops with D3 and K2 in MCT oil. What an unacceptable number of impurities for such a simple composition.

18% of impurities is far more than allowed level for MK-7 in EU Novel Food authorisation.

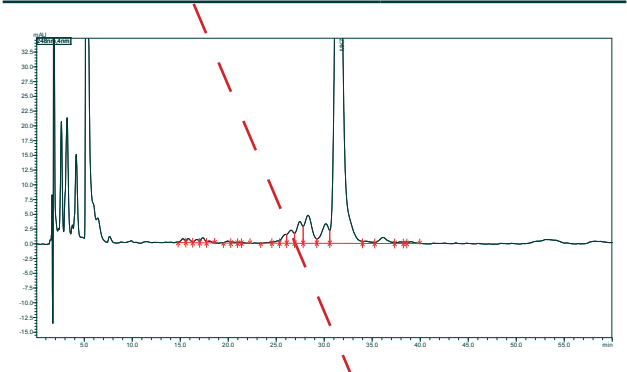
Isomeric purity <USP method> Total impurities



Peak#	Name	Area%
1	MK7	82.042
Total impurities *		17.958

* - Total impurities were taken as a sum of area % of all marked impurities

Related substances <UPLC method> Total impurities



Peak#	Name	Area%
1	MK7	81.880
Total impurities *		18.120



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