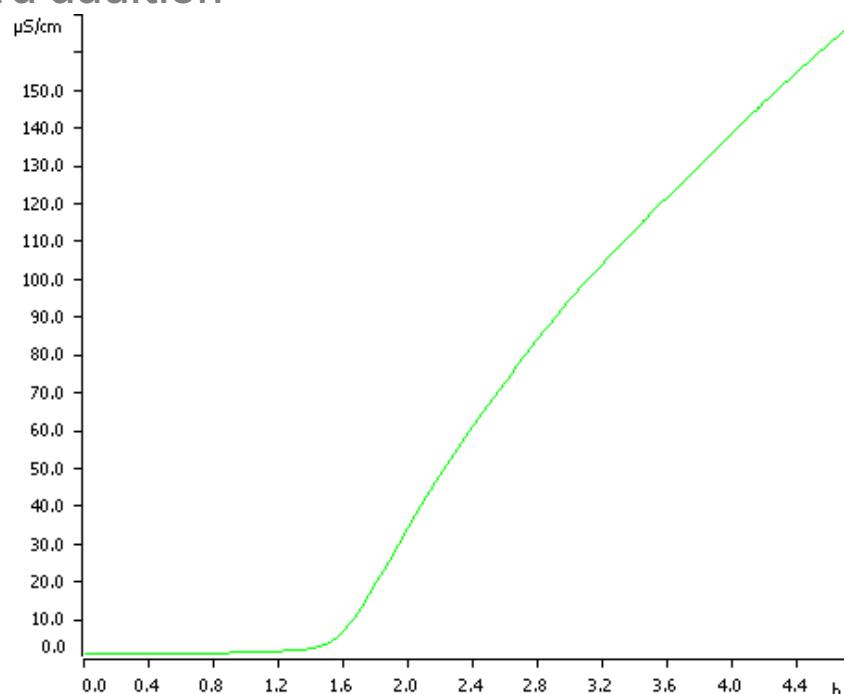


Antioxidant content in wheat germ oil, vitamin C tablet and body lotion

Fast determination of the antioxidant content by standard addition



Some samples, such as cosmetics and food, cannot be measured directly with the Rancimat as no evaluable induction time is obtained. There are many reasons for this, for example a high water content, a too low fat content or various matrix effects. However, using polyethylene glycol (PEG) as carrier material, many of these samples can be directly and reproducibly measured without sample preparation. This is due to the antioxidants that are naturally present in the sample matrix, and which stabilize the induction time of the PEG. The induction time can therefore be directly related to the oxidation stability of the sample.

Furthermore, with a standard addition it is possible to measure the content of antioxidants (AOC) such as vitamin E, vitamin C or an equivalent of it. The decrease of the antioxidants over time (for example, during storage of the sample) can thus be measured and evaluated. In addition, this method eliminates a costly sample preparation. A reproducible and accurate determination of the oxidation stability using the 892 Professional Rancimat can be realized.

Method description

Sample

Wheat germ oil, Vitamin E content of 2.16 mg/g sample
Vitamin C effervescent tablet, Vitamin C content of 51.70 mg/g sample
Body lotion

Sample preparation

The vitamin C effervescent tablet is ground into a fine powder with a pestle in a mortar. The other samples did not require any sample preparation.

Sample	Sample size	Standard addition
Wheat germ oil	300 mg ± 10 mg	Min. 3 additions between 10 µL and 100 µL Vit.E standard
Vitamin C tablet	50 mg ± 5 mg	Min. 3 additions between 10 µL and 300 µL Vit.C standard
Body lotion	1.0 g ± 0.01 g	Min. 3 additions between 10 µL and 30 µL Vit.E standard

Configuration

892 Professional Rancimat	2.892.0010
Equipment for the determination of the temperature correction	6.5616.100
Measuring vessel cover with built-in conductometric measuring cell	6.0913.130

Solutions

Vitamin E standard solution	β (Tocopherol) = 10 mg/mL 500 mg (\pm)- α -tocopherol is weighed into a 50 mL volumetric amber-glass flask. The flask is then filled up to the mark with 1-dodecanol and mixed well. The solution should be stored in the refrigerator when not in use. The solution is stable for about 2 months.
Vitamin C standard solution	β (Ascorbic acid) = 20 mg/mL, 1 g ascorbic acid is weighed into a 50 mL volumetric amber-glass flask. The flask is then filled up to the mark with deionized water. This solution must always be prepared freshly.

Parameters

Sample size	See analysis
Measuring solution	60 mL
Temperature	110 °C for body lotion, 120 °C for wheat germ oil and vitamin C tablet
Temperature correction	auto
Gas flow (air)	20.0 L/h
Conductivity	300 µS/cm
Endpoint(s)	yes
Stop once all the criteria have been fulfilled	yes

Results

Sample (n = 2)	Antioxidant content, verified by manufacturer	Antioxidant content by standard addition	Recovery
Wheat germ oil	2.16 mg/g Vit.E	2.18 mg/g Vit.E	100.9%
Vit.C tablet	51.70 mg/g Vit.C	51.24 mg/g Vit.C	99.1%

Sample (n = 2)	Antioxidant content as equivalent Vit.E	Induction time / h	s(rel) / %
Body lotion	2.15 mg/g	1.65	3.9

Analysis

3.0 g \pm 0.01 g polyethylene glycol is weighed in the reaction vessel as carrier material. Afterwards, depending on the sample and their concentration, different sample sizes are weighed in. The recommended sample sizes are given in the following table.

The sample is weighed in the reaction vessel, then different amounts of standard solution are pipetted into the reaction vessel and the analysis is started. Please note that it is necessary for the calculation to run at least one sample without standard addition. It is recommended to run each determination at least in twice.

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