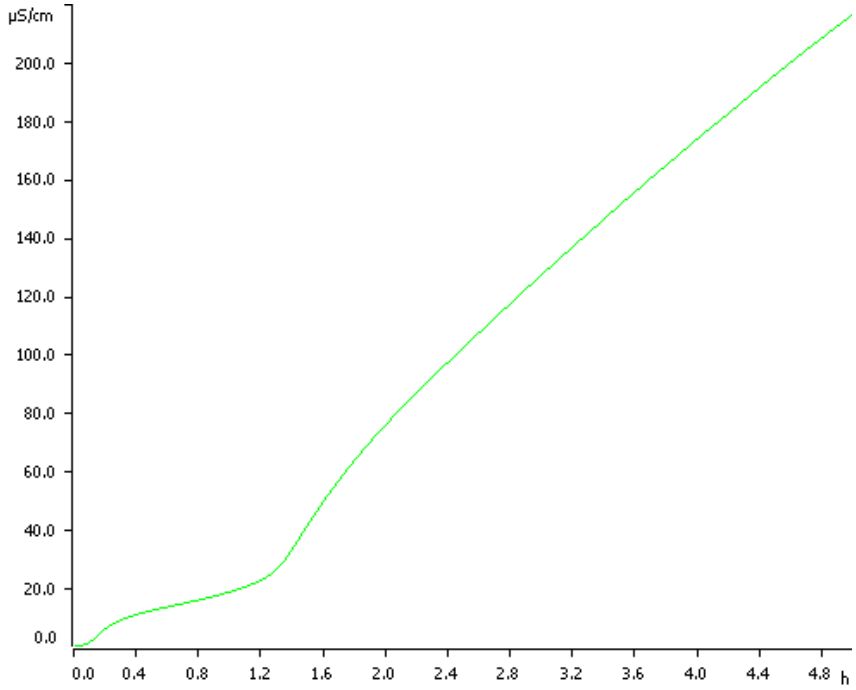
Stability Application Note R-022

Oxidation stability of chocolate

Fast determination of the oxidation stability of chocolate without sample preparation



Oxidation stability is an important quality criterion of chocolate as it provides information about the long-term stability of the product. Cocoa contains various flavonoids that act as antioxidants. The most important and common flavonoids are catechin, epicatechin, and procyanidin. Although the flavonoid content may vary amongst chocolate type, it can be said, the greater the cocoa content in the chocolate, the greater the antioxidant effect.

Chocolate cannot be measured directly with the classical Rancimat method, as no evaluable induction time is obtained. There are many reasons for this, for example a too low fat content or various matrix effects. Traditionally, extraction of the fat from the chocolate using e.g., petroleum ether is therefore necessary.

In this Application Note, the oxidation stability of white, milk and dark chocolate with varying cacao content is determined in without extraction. Instead, polyethylene glycol is used as conducting medium. More information on the Rancimat method can be found on the Metrohm website.

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Method description

Sample

White chocolate

Milk chocolate with cacao content of 6%

Dark chocolate with cacao content of 50%

Dark chocolate with cacao content of 65%

Dark chocolate with cacao content of 81%

Sample preparation

No sample preparation is required.

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

Analysis

3.0 g ± 0.10 g polyethylene glycol and 1.0 g ± 0.10 g sample are weighed in the reaction vessel and the analysis is started.

Parameters

Sample size	1.0 ± 0.10 g
Measuring solution	60 mL
Temperature	110 °C
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 = 4)	Mean value / h	s(abs) / h	s(rel) / %
White chocolate	1.29	0.13	9.9
Milk chocolate	1.57	0.12	7.6
Dark chocolate, 50% cacao	2.53	0.06	2.4
Dark chocolate, 65% cacao	5.12	0.19	3.7
Dark chocolate, 81% cacao	3.85	0.34	8.9

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