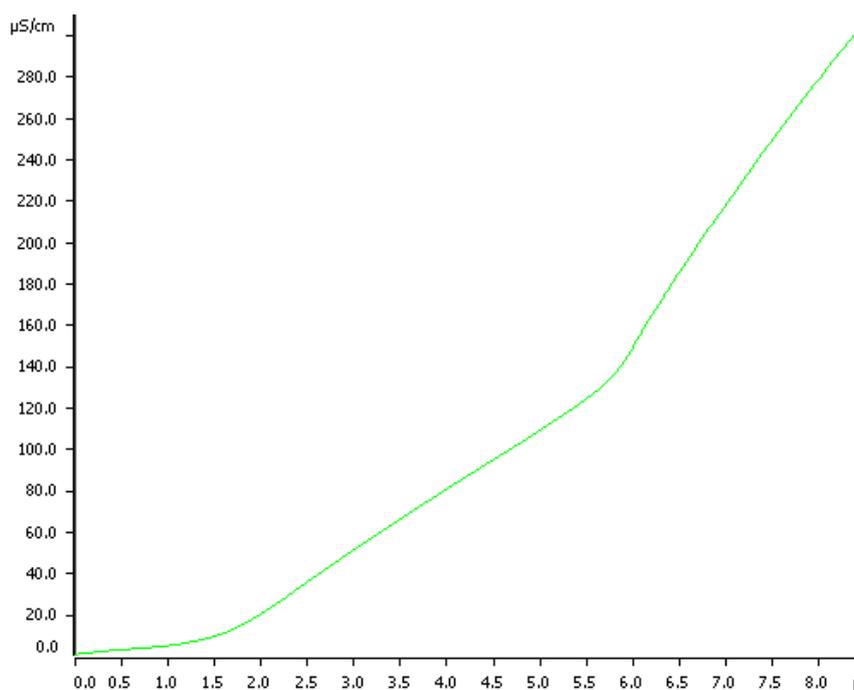


Stability Application Note R-024

Oxidation stability of tea

Fast determination of oxidation stability without sample preparation



Oxidation stability is an important parameter defining the quality of tea. It also provides information about the long-term stability of the naturally included antioxidants and thus the stability of the product. However, tea cannot be measured directly with the Rancimat method, as no evaluable induction time is obtained. The reason for this is that no measurable oxidation product is formed. However, using polyethylene glycol (PEG) as carrier material, many of these samples can be directly and reproducibly measured without any sample preparation. This is due to the antioxidants that are naturally present in the sample matrix, which stabilize the induction time of the PEG. The induction time can therefore be directly related to the oxidation stability of the sample.

A reproducible and accurate determination of the oxidation stability is feasible using the 892 Professional Rancimat. In this Application Notes the oxidation stability of different teas is determined in this way. More information on the Rancimat method can be found on the [Metrohm website](#).

Method description

Samples

Green tea
Black tea
Peppermint tea
Verbena tea
Lime flower tea
Fruit tea
Chamomile tea
Lemon tea

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

3.00 g ± 0.10 g polyethylene glycol and 0.10 g ± 0.01 g sample is weighed in the reaction vessel and the analysis is started.

Parameters

Sample size	0.10 ± 0.01 g
Measuring solution	60 mL
Temperature	130 °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) / %
Green tea (Japan, "Sencha")	10.81	0.68	6.3
Green tea (China, "Chun Mee")	4.89	0.38	7.8
Green tea (China, >3 years stored)	2.11	0.15	7.2
Black tea (England, "Earl Grey")	2.39	0.13	5.4
Black tea (England, "English Breakfast")	1.26	0.07	5.9
Peppermint tea (Switzerland)	2.54	0.24	9.4
Peppermint tea (Switzerland, >2 years stored)	0.95	0.02	2.6
Verbena tea (Switzerland)	6.35	0.53	8.4
Lime blossom tea (Switzerland)	0.76	0.07	9.0
Fruit tea (Switzerland)	0.44	0.02	4.1
Chamomile tea (Switzerland)	0.43	0.02	3.5
Lemon tea (Switzerland)	0.38	0.03	7.7