analytikjena

Application Note

UV VIS

Fields of Application / Industry:

- Chemistry / Polymer Industry
- Clinical Chemistry / Medicine / Hygiene / Health Care
- Cosmetics
- Electronics
- Energy
- Environment / Water / Waste
- Food / Agriculture
- Geology / Mining
- Material Analysis
- Metallurgy / Galvanization
- Pharmacy
- Refineries / Petrochemistry
- Semi-Conductor Technology
- Others

积分球调味料色度测量

摘要：

积分球是测量固体、液体、粉末状样品的吸收、透射和漫反射的理想工具，粗糙或带有纹理表面的固体样品易导致光扩散，使用积分球测量时可完全消除光损失，使漫反射光都可以到达检测器。

本文利用德国耶拿 specord 210 plus 紫外可见分光光度计的软件中色度测量特殊工具，通过调节不同的光的入射角和光照模型，采用软件提供的不同颜色指标可以进行计算的可能性，对调味品颜色进行测量。

实验结果表明使用德国耶拿公司 SPECORD 250 PLUS 型紫外分光光度计加积分球附件，能方便、快速实现调味品颜色的准确测量。

Short Application UV VIS

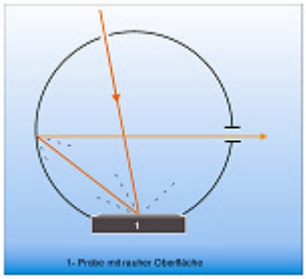
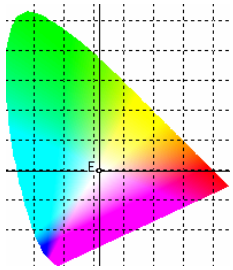
Color location determination of flavoring substances using the integrating sphere

Introduction

The Ulbricht sphere (integrating sphere) is outstandingly suited for transmittance and reflectance measurements of solid and liquid samples as well as powdery samples.

For the color location determination of flavoring agents, VIS spectra are scanned and then evaluated using a color software. Such software offers the possibility of calculating different color indexes with consideration of different angles of incidence and light models.

The chromaticity coordinates x and y characterize the color in a two-dimensional Cartesian space; in this respect, the saturation must be specified and given separately. The CIE coordinates characterize the color in a three-dimensional Cartesian space, while taking the brightness into account. The brightness of a color tone is represented by the value "L" in the CIE lab system. In this respect, the value "a" stands for the red-green portion and the value "b" for the yellow-blue portion.

		
Ulbricht sphere	Set-up: Beam path of the Ulbricht sphere	CIE chromaticity diagram

Sample preparation

Flavoring agents are powdery substances that were transferred and pressed into the appropriate support for powder samples using a spatula. The surface of the samples was then leveled.

Performance

The gauge for powdery samples of the integrating sphere for the SPECORD® is best suited for these requirements. The reference measurement was carried out against spectralon. The following parameter settings were used:

General

Display:	Reflectance/Reflection
Correction:	Reference
Slit:	4 nm

Mode

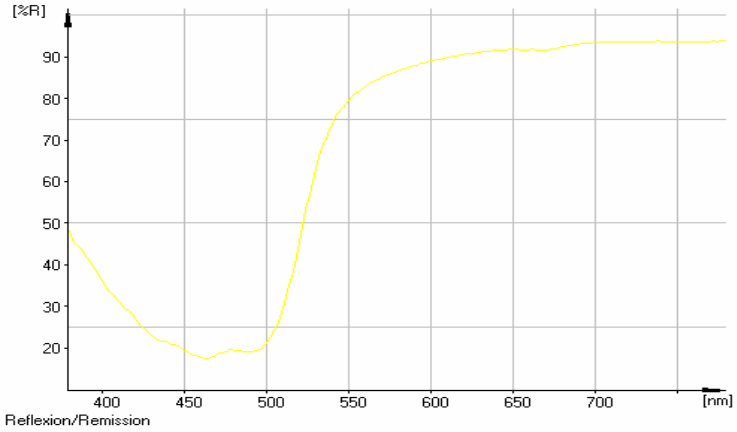
Measurement mode:	Step mode
Range:	380 - 780 nm
Step width:	2 nm
Integration time:	0.1 s

Results / Evaluation

The evaluation was effected using the described color software. The CIE coordinates, the chromaticity coordinates x and y as well as the CIE lab system were used as the color systems. In this regard, an observation angle of 2° and the light model C (most corresponding to natural light) is selected.

For the samples the following reflectance spectra were recorded:

Flavoring agent: Cheese

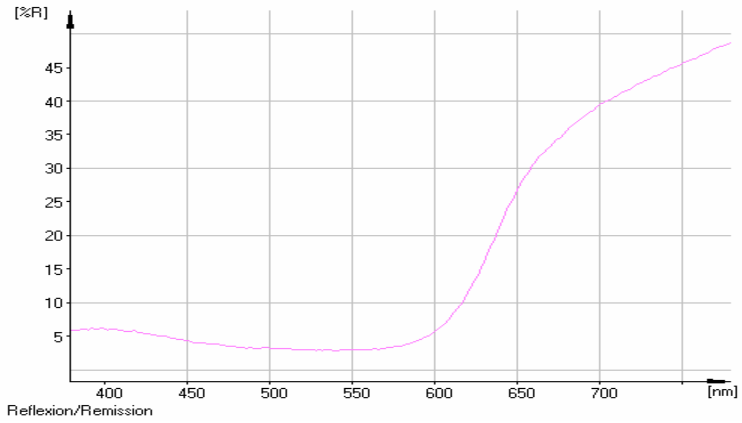


Standard color values

X= 71.8312	Y= 71.0062	Z= 24.7485
x= 0.4286	y= 0.4237	
L= 87.4880	a= -12.0845	b= 1.2220
Cab= 12.1462	hab= -0.1008	

CIE chromaticity diagram - specific color

Flavoring agent: Beetroot



Standard color values

X= 7.4183 Y= 4.8705 Z= 5.0187

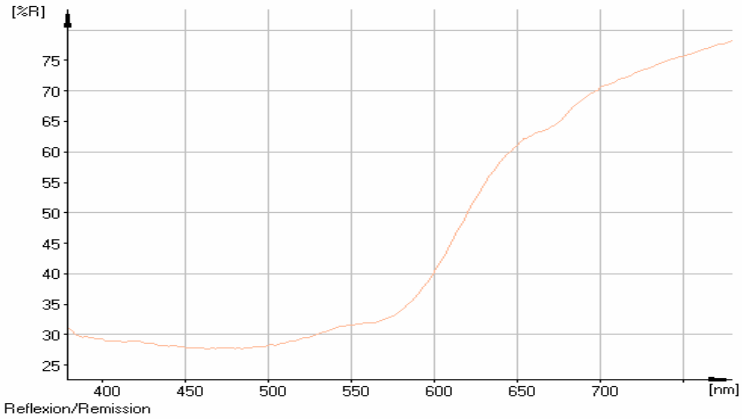
x= 0.4286 y= 0.2814

L= 26.3626 a= 21.0150 b= -31.0707

Cab= 37.5103 hab= -0.9761

CIE chromaticity diagram – specific color

Flavoring agent: Tomato



Standard color values

X= 37.9580 Y= 34.4679 Z= 33.1460

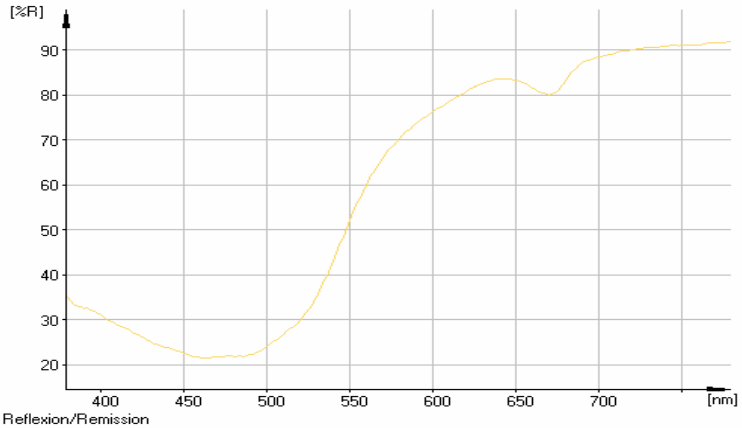
x= 0.3595 y= 0.3265

L= 65.3323 a= 0.2931 b= -55.1033

Cab= 55.1040 hab= -1.5655

CIE chromaticity diagram – specific color

Flavoring agent: Tomato TA



Standard color values

X= 60.4537 Y= 54.2797 Z= 27.5894

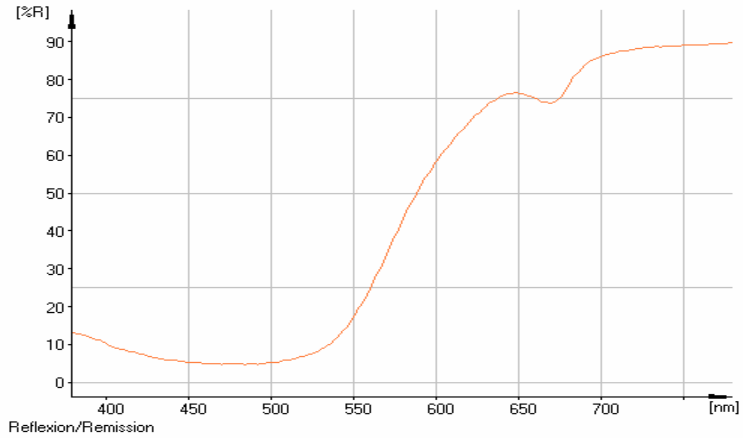
x= 0.4248 y= 0.3814

L= 78.6246 a= 1.8780 b= -20.5964

Cab= 20.6819 hab= -1.4799

CIE chromaticity diagram – specific color

Flavoring agent: Catsup TA (new)

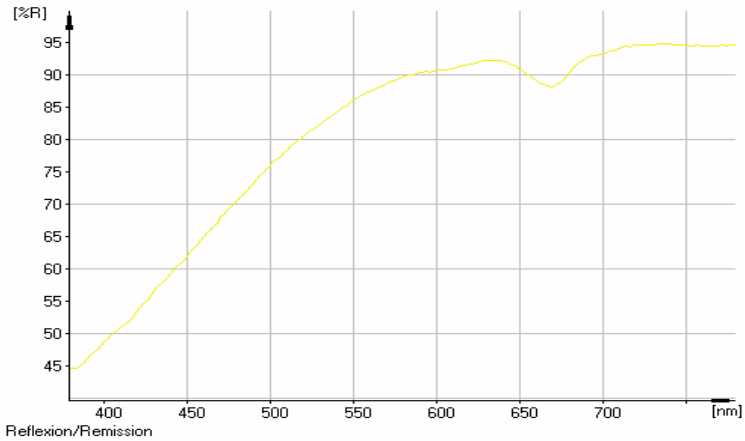


Standard color values

X= 40.5579	Y= 29.2123	Z= 6.6696
x= 0.5306	y= 0.3822	
L= 60.9685	a= 26.9366	b= 18.2427
Cab= 32.5327	hab= 0.5953	

CIE chromaticity diagram – specific color

Flavoring agent: Catsup TA (old)



Standard color values

X= 82.3390	Y= 85.2500	Z= 74.8792
x= 0.3396	y= 0.3516	
L= 93.9907	a= -19.9069	B= -66.6607
Cab= 69.5697	hab= 1.2806	

CIE chromaticity diagram – specific color

The described method was ideally suited for determining the color location of the flavoring substances. The characterization of the color location can be effected for all color coordinates specified. In this respect, the color discrimination is always guaranteed.

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