

## Determination of Curcuminoids in turmeric powder *UniversalExtractor*

*E-800: Extraction of curcuminoids from turmeric powder*

A simple and reliable procedure for the determination of curcuminoids content in turmeric is introduced. Curcuminoids include three components, curcumin (CUR) as the main component, and two methyl derivatives, Demethoxycurcumin (DMC) and Bisdemethoxycurcumin (BDMC) [1]. Curcumin is a coloring substance with antioxidant properties, therefore commonly used in food, cosmetic and pharmaceutical industry [2,3]. It has also been shown, that curcumin interferes with multiple cell signaling cascades, proving its anti-cancer properties [4]. In the presented application, the sample is extracted with the UniversalExtractor E-800 using the Hot Extraction method. The total curcuminoids content is determined using UV/Vis spectrophotometry and compliant with the official Manual of FSSAI (Food Safety and Standards Authority of India) [5] and with the official method of 'Turmeric Rhizome' from the European Pharmacopoeia [6].

### 1. Introduction

Since curcuminoids are active substances used in many industries, the determination of their content in turmeric is of great importance, also for quality control reasons. In the presented application, the sample is extracted with the UniversalExtractor E-800 using the Hot Extraction method. The total curcuminoids content is determined using UV/Vis spectrophotometry.

### 2. Experimental

Equipment: UniversalExtractor E-800

Powder from organic curcumin, labelled curcuminoids content: 3.7%

Extraction: 0.1 g sample was weighed into a cellulose thimble. The sample was extracted using the UniversalExtractor E-800 HE, applying the parameters specified in Table 1. The sample was extracted in triplicates.

Table 1: Parameters for Hot Extraction with the UniversalExtractor E-800

Extraction method	Hot Extraction
Solvent	Ethanol
Extraction	2.5 hours
Heating level	18
Rinse step	10 min
Heating level	18
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Heating level	11
Solvent volume	120 mL

The absorbance of the sample solution is determined and compared to the pure ethanol at 425 nm. The curcuminoids content was revealed based on the absorbance and based on the calibration curve.

### 3. Results

The determined curcuminoids content is presented in Table 2. The results are in good correlation with the labelled value of 3.7%. The low relative standard deviation indicates a complete extraction after 2.5 h extraction time.

Table 2: Determined curcuminoids content of turmeric powder (rsd: relative standard deviation), n=3

Sample	Curcuminoids content	Mean value	rsd
Curcumin	3.61%	<b>3.60%</b>	<b>0.43%</b>
	3.58%		
	3.61%		



### 4. Conclusion

Determination of curcuminoids content in turmeric powder by use of the UniversalExtractor E-800 provides reliable and reproducible results. As compared to the method described in Manual of FSSAI (Food Safety and Standards Authority of India) and European Pharmacopoeia, the laborious filtration steps after the extraction are omitted using the BUCHI automated extraction system.

### 5. Acknowledgements

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### 6. References

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For more detailed safety considerations please refer to the corresponding MSDS.