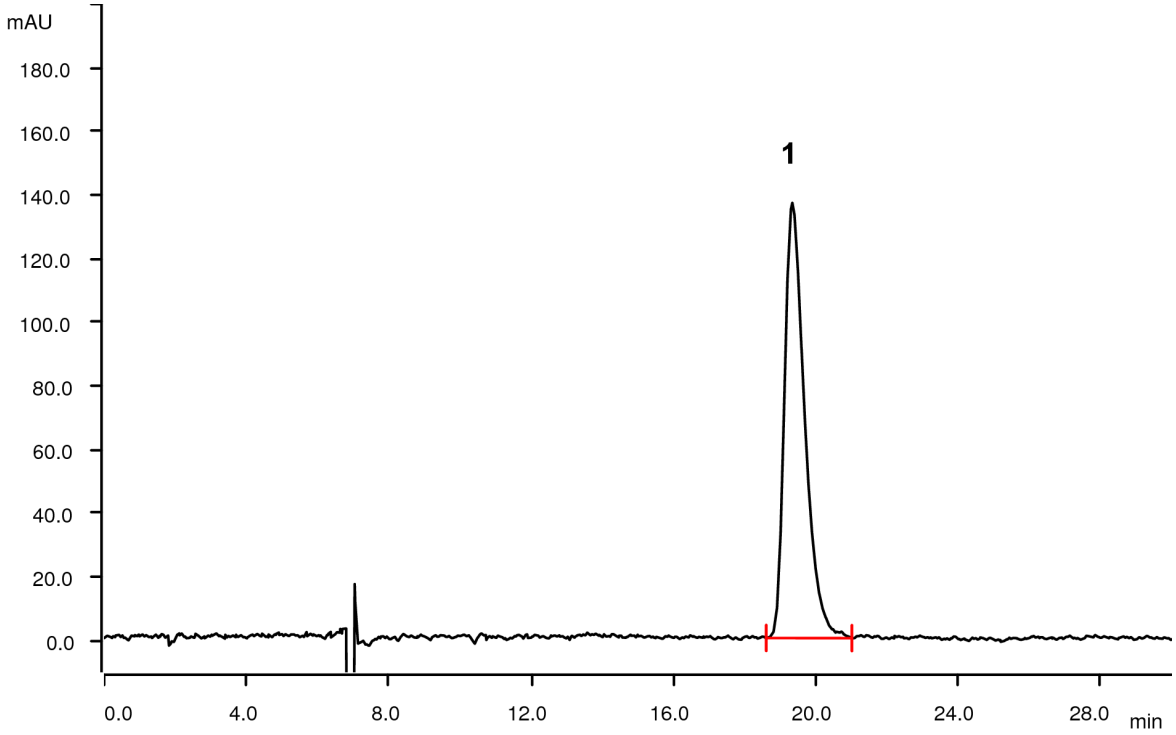
IC Application Note U–76

Zinc Oxide Assay as per USP General Chapter <591>[1)]



USP is updating the General Chapter <591> «Zinc Determination» monograph to include ion chromatography as a method for the assay. Zinc oxide is used in various skin care creams, drugs, and drug products. The ion chromatography analysis involves separation of zinc using, e.g., L91 (Metrosep A Supp 10) followed by post-column reaction using 4-(2-pyridylazo)resorcinol (PAR) reagent and subsequent detection at 530 nm wavelength.

Results

	Cation	Concentration [mg/L]	Recovery [%]
1	Zinc	14.87	99.1

1) Valid May 1st, 2018 (USP41-NF36)

Metrohm

Sample

Ultrapure zinc oxide

Sample preparation

0.1868 g of sample dissolved in 10 mL 6 mol/L HCl and made up to 100 mL with ultrapure water.

Columns

Metrosep A Supp 10 - 250/4.0	6.1020.030
Metrosep A Supp 10 Guard/4.0	6.1020.500

Solutions

Eluent	7.0 mmol/L dipicolinic acid 66.0 mmol/L potassium hydroxide 5.6 mmol/L potassium sulfate 74 mmol/L formic acid (pH 4.2)
PCR reagent	0.5 mmol/L 4-(2-pyridylazo) resorcinol 1.0 mol/L 2-methylaminoethanol 0.50 mol/L ammonium hydroxide 0.3 mol/L sodium bicarbonate

Parameters

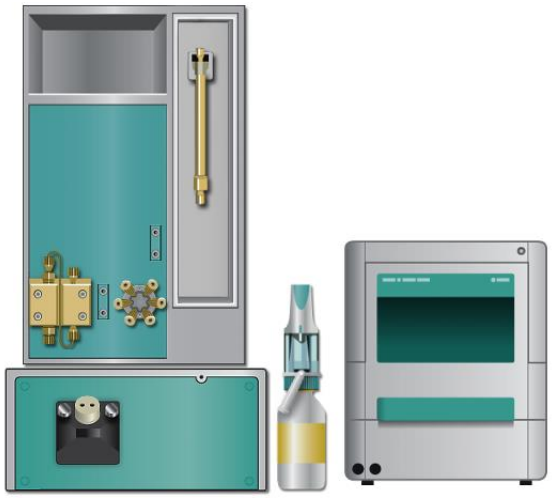
Flow rate	1.2 mL/min
Injection volume	10 µL
P_{max}	25 MPa
Recording time	30 min
Column temperature	30 °C
Wavelength	530 nm
Reference	790 nm
Duration	300 ms

Analysis

UV/VIS detection

Instrumentation

930 Compact IC Flex Oven/Deg	2.930.2160
944 UV/VIS Detector	2.944.0010
889 IC Sample Center	2.889.0010
800 Dosino	2.800.0010
Dosing Unit 20 mL	6.3032.220
Reactor complete	6.2845.200



Application performed by Metrohm USA

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