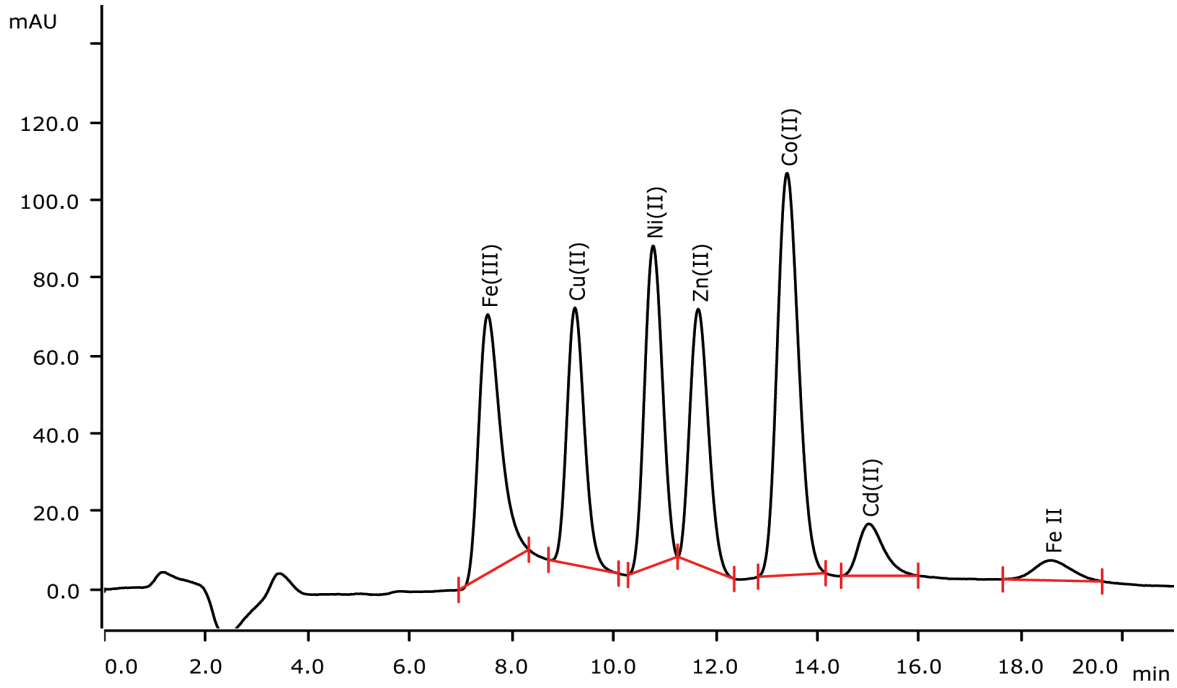
IC Application Note U–67

Trace determination of transition metals with preconcentration (MiPCT), post-column reaction, and UV/VIS detection



The analysis of transition metals by ion chromatography is possible with direct conductivity detection (see AN-C-137) as well as with UV/VIS detection after post-column reaction. Here, the cations are separated as anionic complexes and analysed after post-column reaction with PAR and subsequent UV/VIS detection. Speciation determination of iron (Fe(II) and Fe(III)) is achieved. For trace analysis, Metrohm intelligent Preconcentration Technique (MiPCT) is applied.

Results

	Concentration [µg/L]
Cu(II), Ni(II), Zn(II), Co(II), Cd(II)	10.0
Fe(II)	7.5
Fe(III)	12.4

Metrohm

Sample

Standard solution

Sample preparation

Metrohm intelligent Preconcentration Technique (MiPCT)

Columns

Metrosep A Supp 10 - 150/2.0	6.1020.220
Metrosep A Supp 10 Guard/2.0	6.1020.600
Metrosep C PCC 1 VHC	6.1010.320

Solutions

Eluent	3.0 mmol/L 2,6 pyridine dicarboxylic acid 10 mmol/L sodium sulfate 66 mmol/L sodium hydroxide 80 mmol/L formic acid
Post-column reagent	0.15 mmol/L PAR 80 mmol/L nitric acid 0.4 mol/L ammonia

PAR = 4-(2-pyridylazo)-resorcinol

Analysis

UV/VIS detection after post-column reaction

Parameters

Flow rate	0.3 mL/min
Flow rate PCR	0.2 mL/min
Injection volume	3000 µL (MiPCT)
P_{max}	20 MPa
Recording time	20 min
Column temperature	55 °C
PCR temperature	55 °C
Wavelength (direct)	510 nm
Reference	790 nm

Instrumentation

940 Professiona IC Vario ONE/HPG	2.940.1140
887 Professional UV/VIS Detector Vario	2.944.0010
858 Professional Sample Processor	2.858.0010
943 Professional Reactor Vario	2.943.0110
800 Dosino	2.800.0010
IC equipment: MiPCT	6.5330.140