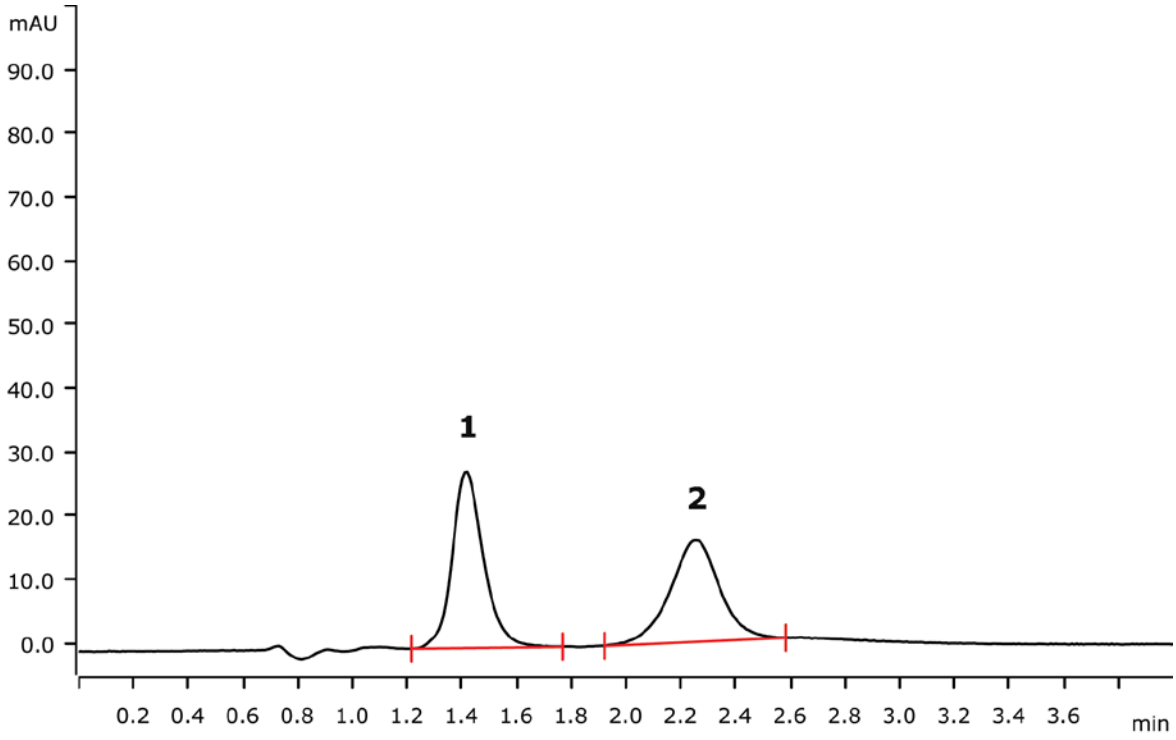
IC Application Note U–72

Speciation of vanadium(IV) and vanadium(V) as EDTA complexes in Benfield solution applying UV/VIS detection



The Benfield Process is a well known procedure to remove H_2S and CO_2 from petroleum and industrial gases. Vanadium pentoxide is added as a corrosion inhibitor and is most effective in a certain V(IV)/V(V) ratio. Therefore, speciation and determination of V(IV) and V(V) is important. This speciation is easily achieved on A Metrosep A Supp 5 - 50/4.0 column with EDTA as an eluent and UV/VIS detection at 282 nm.

Results

	Anion	Concentration [g/L]	RSD [%, n = 7]
1	Vanadium (IV)	8.64	0.7
2	Vanadium (V)	1.25	1.1

Metrohm

Sample

Benfield solution

Sample preparation

Dilution of 0.2 g of sample in 100 mL of diluent.

Columns

Metrosep A Supp 5 - 50/4.0	6.1006.550
Metrosep RP 2 Guard/3.5	6.1011.030

Solutions

Eluent	20 mmol/L EDTA trisodium salt
Diluent	20 mmol/L EDTA trisodium salt

Analysis

UV/VIS detection

Parameters

Flow rate	0.8 mL/min
Injection volume	20 µL
P_{max}	15 MPa
Recording time	4 min
Column temperature	30 °C
Wavelength	282 nm
Measuring duration	500 ms

Instrumentation

940 Professional IC Vario ONE	2.940.1100
944 Professional UV/VIS Detector Vario	2.944.0010
858 Professional Sample Processor	2.858.0020