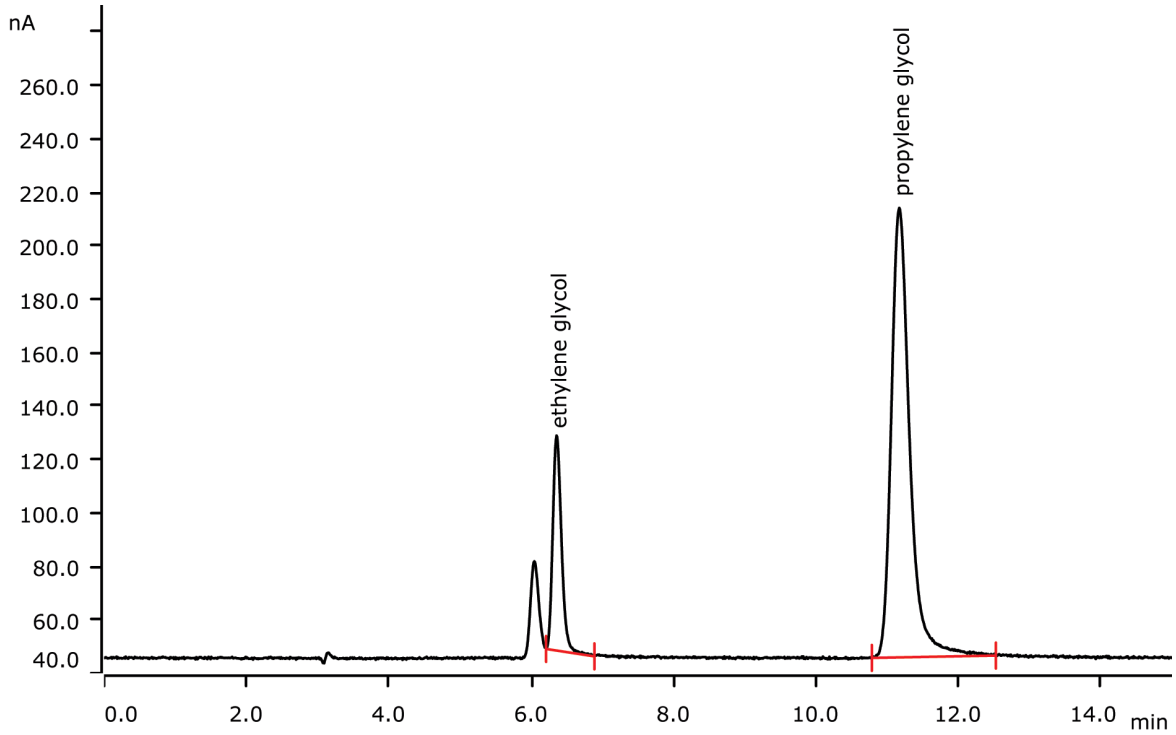
IC Application Note P–60

Ethylene and propylene glycol applying pulsed amperometric detection



Glycol solutions are used in antifreeze, e.g., in automobiles. Because of its toxicity, monoethylene glycol (MEG) is being increasingly replaced by propylene glycol. This Application Note shows the separation and quantification of both glycols. Separation is achieved on a Metrosep Carb 2 - 250/4.0 column. As glycols show no conductivity and have no chromophore, pulsed amperometric detection (PAD) is the detection mode of choice.

Results

Compound	Concentration [g/kg]	RSD (%, n = 5)
Ethylene glycol	157.8	3.2
Propylene glycol	162.3	1.9

Metrohm

Sample

Glycol sample

Sample preparation

Dilution 1:10’000 with ultrapure water.

Columns

Metrosep Carb 2 - 250/4.0	6.1090.430
Metrosep Carb 2 Guard/4.0	6.1090.500

Solutions

Eluent	15 mmol/L sodium hydroxide

Parameters

Flow rate	0.5 mL/min
Injection volume	1.5 µL
Recording time	15 min
Column temperature	32 °C

PAD Parameters

Cell	Wall-Jet cell
Working electrode	Gold
Reference electrode	Palladium
Spacer	50 µm
Measuring potential	0.05 V
Measuring duration	100 ms
Cycle duration	550 ms
Measuring range	200 µA
Temperature	35 °C
Mode	PAD

Analysis

Pulsed amperometric detection

Instrumentation

940 Professional IC Vario ONE	2.940.1100
IC Amperometric Detector	2.850.9110
858 Professional Sample Processor	2.858.0020
IC equipment Wall-Jet cell: Carb (Au, Pd)	6.5337.010