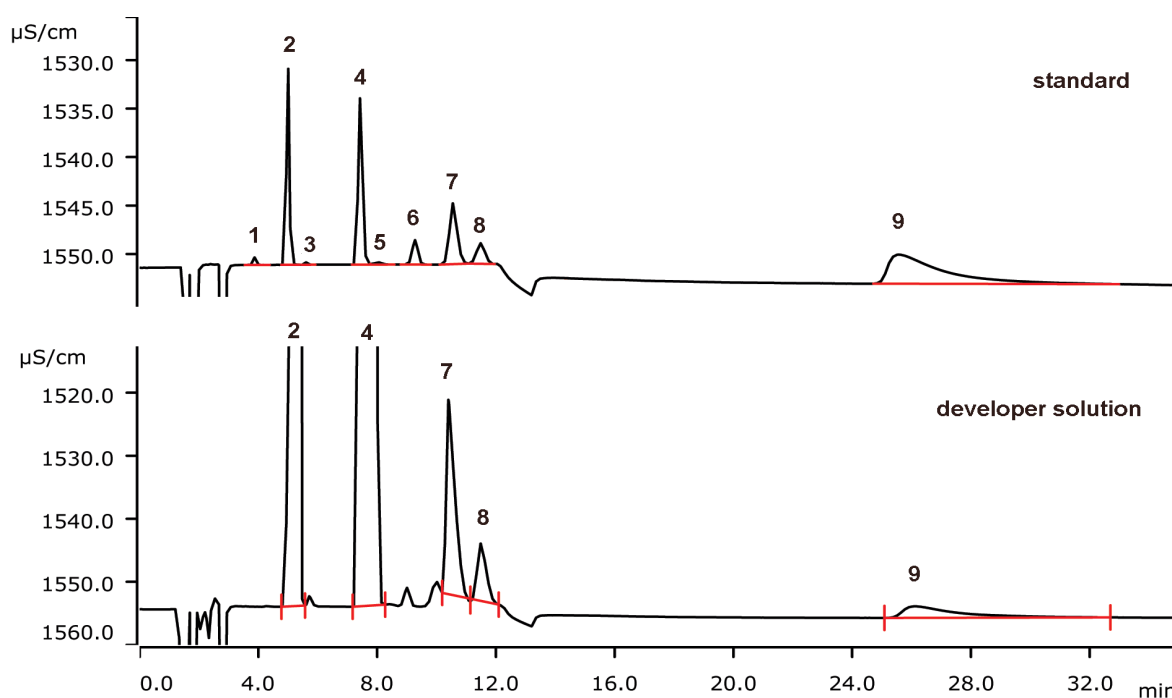


# Cationic components in a photographic developer solution applying a flow gradient



Determination of N,N-diethylhydroxylamine (DEHA), triisopropanolamine (TIPA), and a cationic color developing component (CDC) in a developer solution. The determination is performed on a high capacity Metrosep C 6 - 250/4.0 column with subsequent direct conductivity detection. To reduce the retention time of the strongly retained color developing compound the flow rate is increased after the elution of the amines.

## Results

| Cation      | Concentration |              | Cation | Concentration |              |
|-------------|---------------|--------------|--------|---------------|--------------|
|             | Std. [mg/L]   | Sample [g/L] |        | Std. [mg/L]   | Sample [g/L] |
| 2 Sodium    | 10.0          | 3.2          | 8 TIPA | 100           | 9.8          |
| 4 Potassium | 25.0          | 21.0         | 9 CDC  | 1000          | 11.6         |
| 7 DEHA      | 10.0          | 1.2          |        |               |              |

The standard solution contains lithium (1), ammonium (3), triethanolamine (5), and magnesium (6) as well.

### Sample

Photographic color developer

### Sample preparation

Dilution 1:20 with 2 mmol/L nitric acid.

### Columns

|                         |            |
|-------------------------|------------|
| Metrosep C 6 - 250/4.0  | 6.1051.430 |
| Metrosep RP 2 Guard/3.5 | 6.1011.030 |

### Solutions

|        |                                       |
|--------|---------------------------------------|
| Eluent | 5.0 mmol/L nitric acid<br>10% acetone |
|--------|---------------------------------------|

### Analysis

|                               |
|-------------------------------|
| Direct conductivity detection |
|-------------------------------|

### Parameters

|                         |            |
|-------------------------|------------|
| Flow rate (0...12 min)  | 1.0 mL/min |
| Flow rate (12...35 min) | 1.5 mL/min |
| Injection volume        | 20 µL      |
| P <sub>max</sub>        | 20 MPa     |
| Recording time          | 35 min     |
| Column temperature      | 50 °C      |

### Instrumentation

|                          |            |
|--------------------------|------------|
| 930 Compact IC Oven/Deg  | 2.930.2160 |
| IC Conductivity Detector | 2.850.9010 |
| 919 Autosampler plus     | 2.919.0020 |

