

CE applications – pharmaceuticals, beverages, environmental analyses



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ANALYTICAL EQUIPMENT



ISO 9001:2000
Reg. №: Q-04.04.18

Capillary electrophoresis system CAPEL-105M

- **Pharmacological industry**
medicines formulations,
pharmacokinetics
- **Environmental analysis**
pesticides, inorganic ions
- **Food industry**
preservatives, dyes, target compounds,
etc.
- **Forensic studies**
drugs of abuse, explosives, lethal
markers, etc.
- **Chemical industry**
- **Biotechnological research**
peptides, proteins, DNA / RNA,
affinity studies,
immunoanalyses



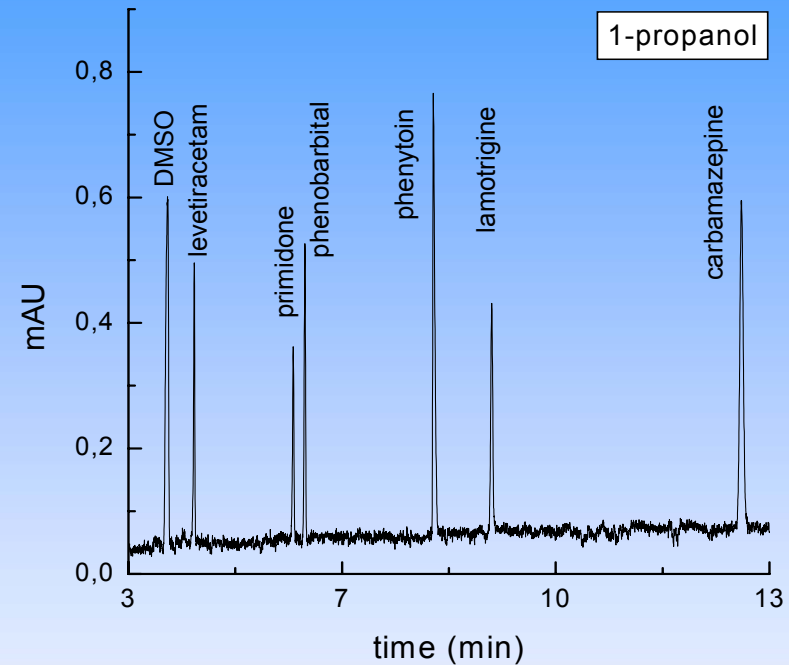
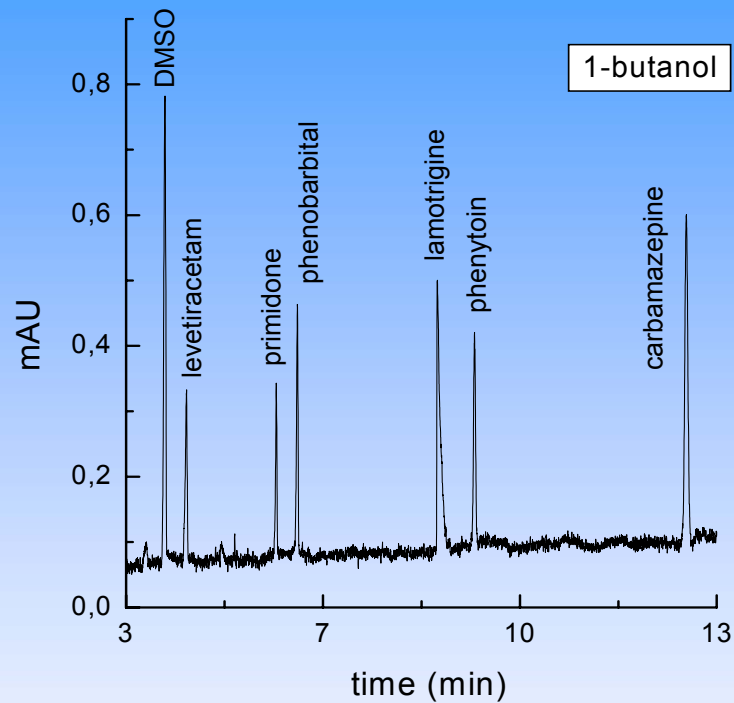
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Pharmacology. Analysis of antiepileptic drugs



Selectivity is changed with addition of different organic modifiers



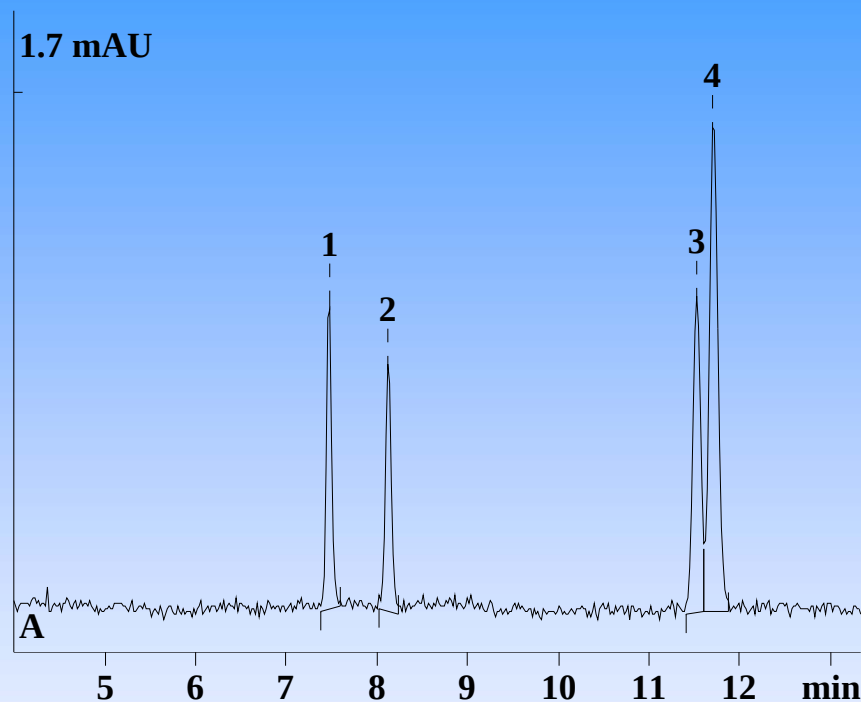
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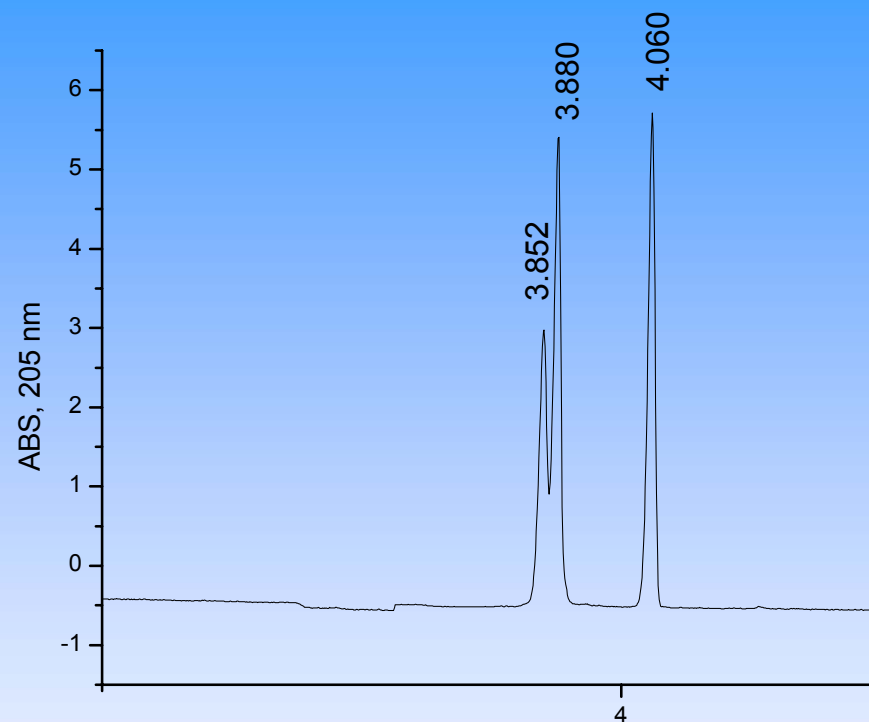
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Pharmacology. Analysis of biologically active peptides and similar antibiotics



Sample: biologically active peptides

Buffer: phosphate, pH 2.5



Sample: penicillin-based antibiotics

Buffer: borate with SDS, pH 8.3



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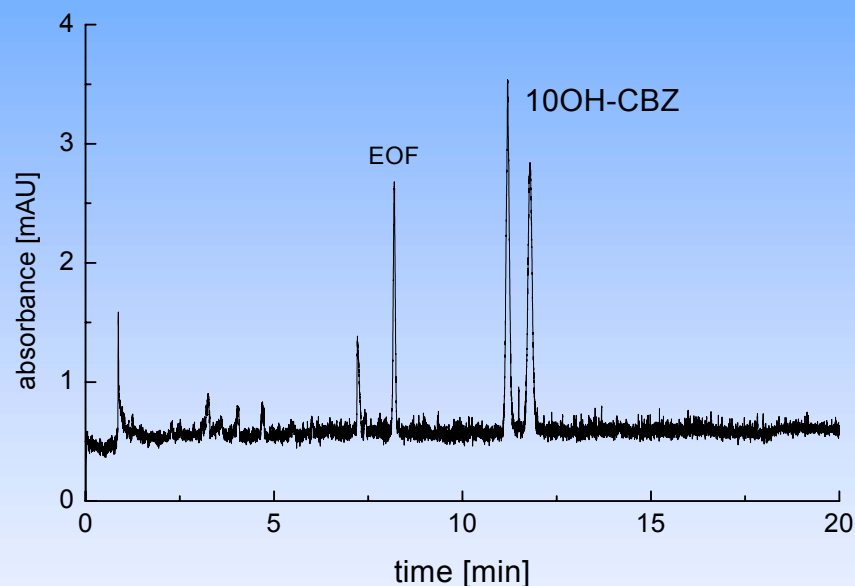
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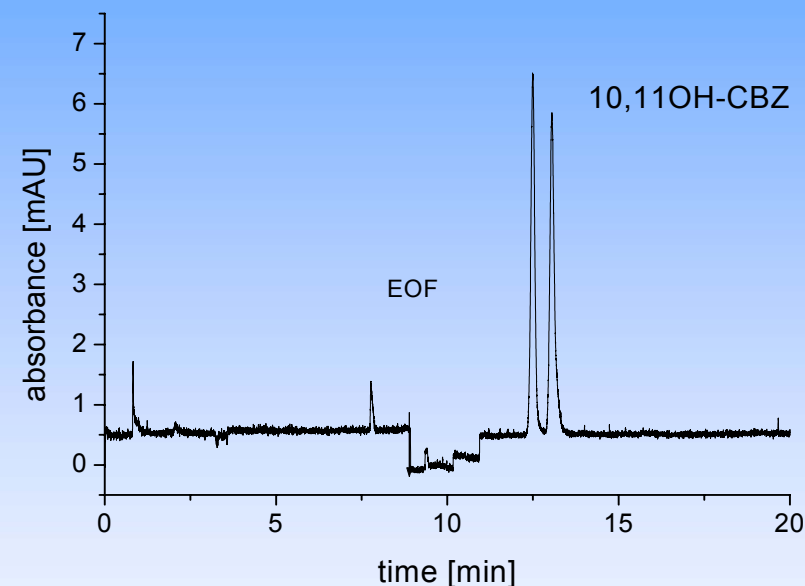
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Pharmacology. Chiral analysis

Marziali et al, Fig.4, top



Marziali et al., Fig. 4 bottom



Separation of chiral isomers of carbamazepine derivatives



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Instrumental features, favorable for broad range of applications

- Detection by spectrophotometer
- Broad range of temperature settings for capillary thermostating
- High current limit – 200 μA
- Extended range of low and high pressure mode
- Software tools



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Beer analysis.

What can be analysed

- Bitter and hop acids
- Inorganic ions
- Organic acids
- Aminoacids, bound and free
- Vitamins
- Fermentable carbohydrates
- Pesticides
- and many other compounds



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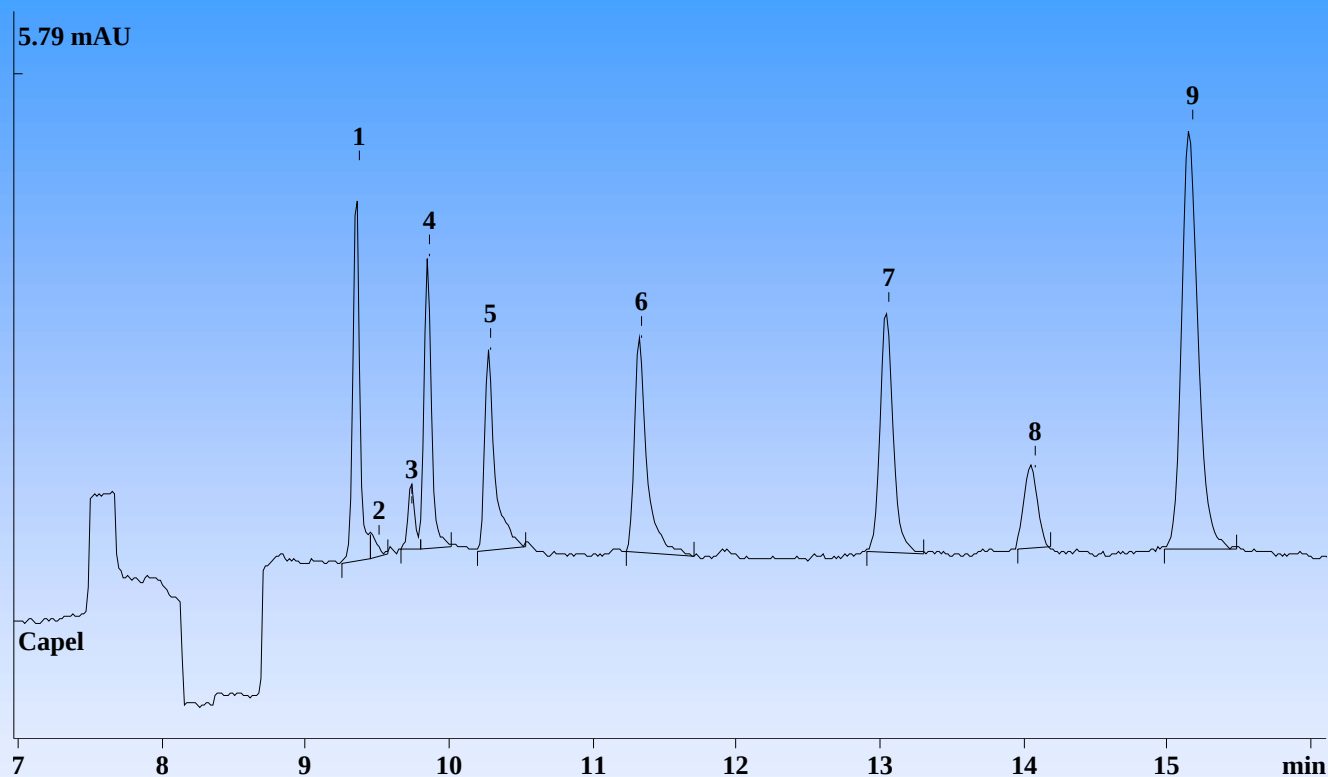
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Beer analysis

Bitter and hop acids standards



Sample: ICS-12 standard (iso- α -acids) and ICE standard (α - and β -acids)



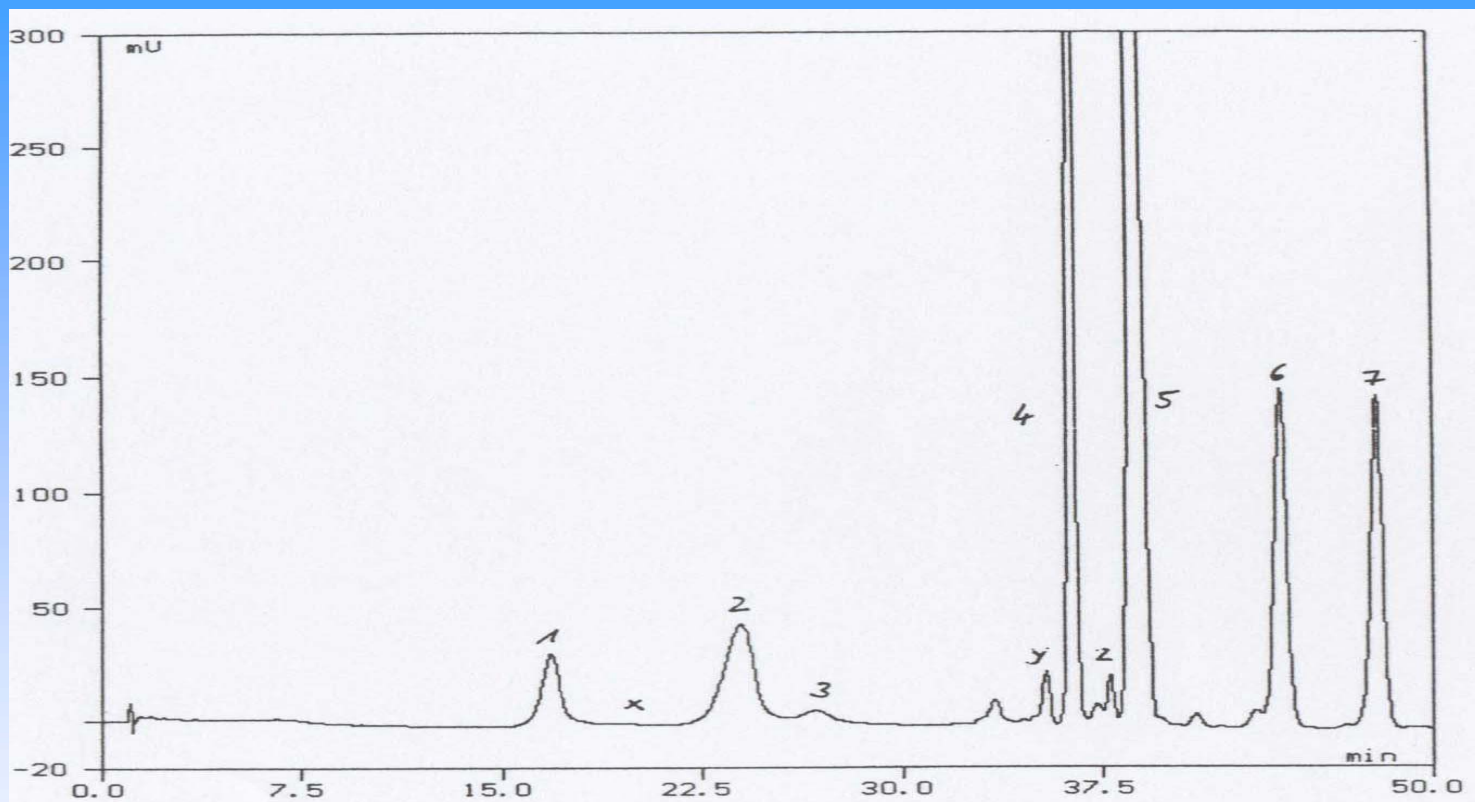
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Beer analysis according to EBC



Method: HPLC; Flow rate 1 mL/min,

Eluent : methanol/H₂O/H₃PO₄



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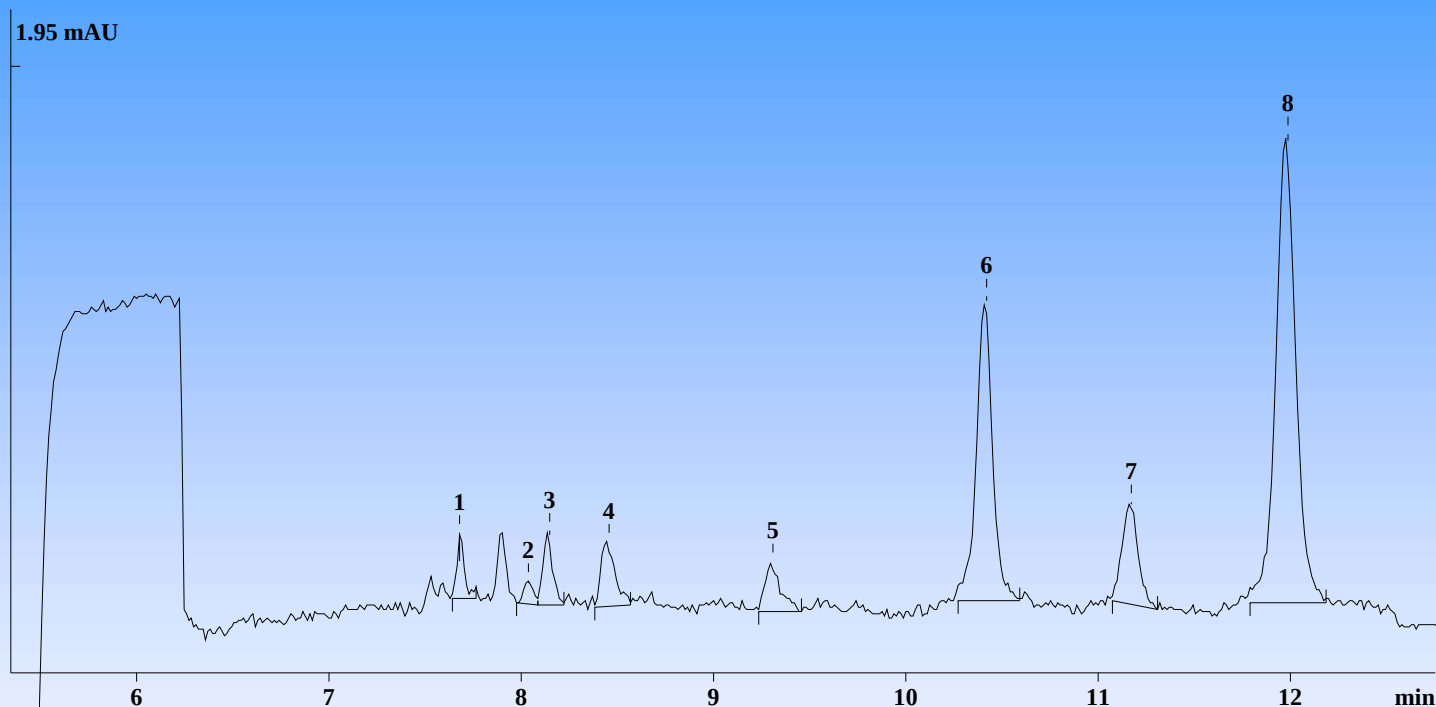
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Beer analysis

Bitter and hop acids standards



Sample: dark beer "X"

Detection: 270 nm / 314 nm

Buffer: borate with SDS



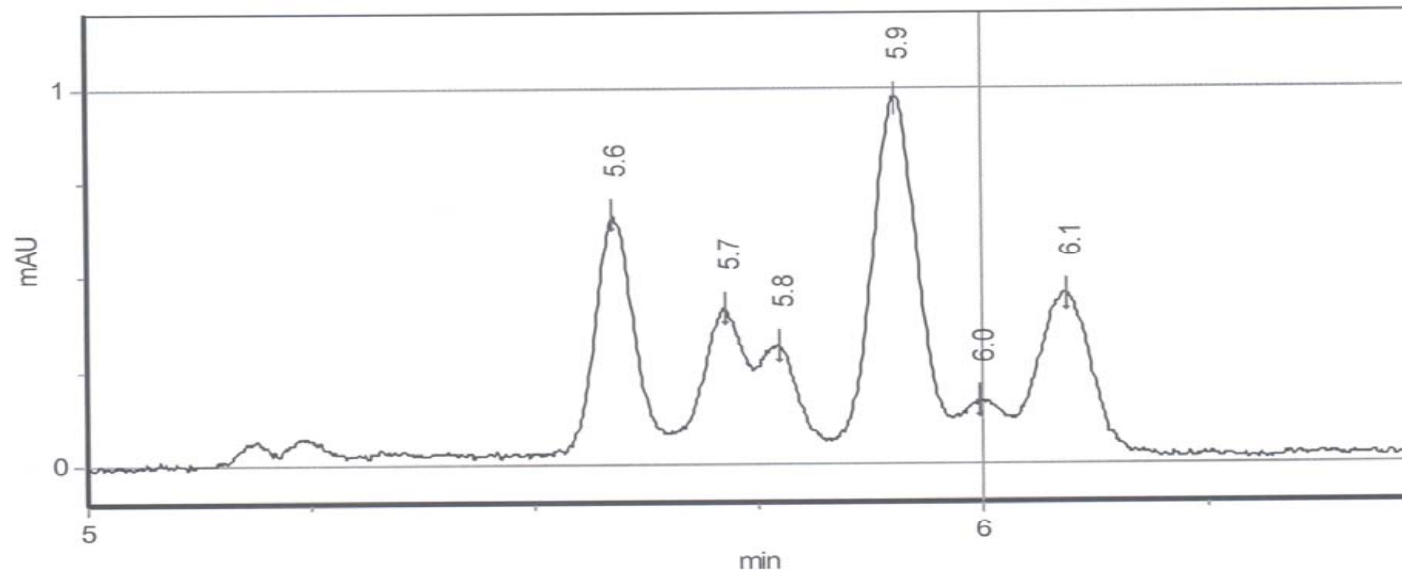
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Beer analysis. Determination of α - and β -acids in wort.



Number	Time	Height	Area	Conc.,mg/l	Component name	WHM	TP
1	5.6	0.61	16.90	0.00		0.043	92136.2
2	5.7	0.23	5.19	0.00		0.035	147622.6
3	5.8	0.14	2.80	0.00		0.038	125663.7
4	5.9	0.88	28.40	0.00		0.050	77226.1
5	6.0	0.05	0.92	0.00		0.032	198777.1
6	6.1	0.37	12.92	0.00		0.057	64056.7

Puffer: 25 mM Borat; 50 mM SDS;
pH=9,2
Probe (Würze) 1:2,5 in Puffer



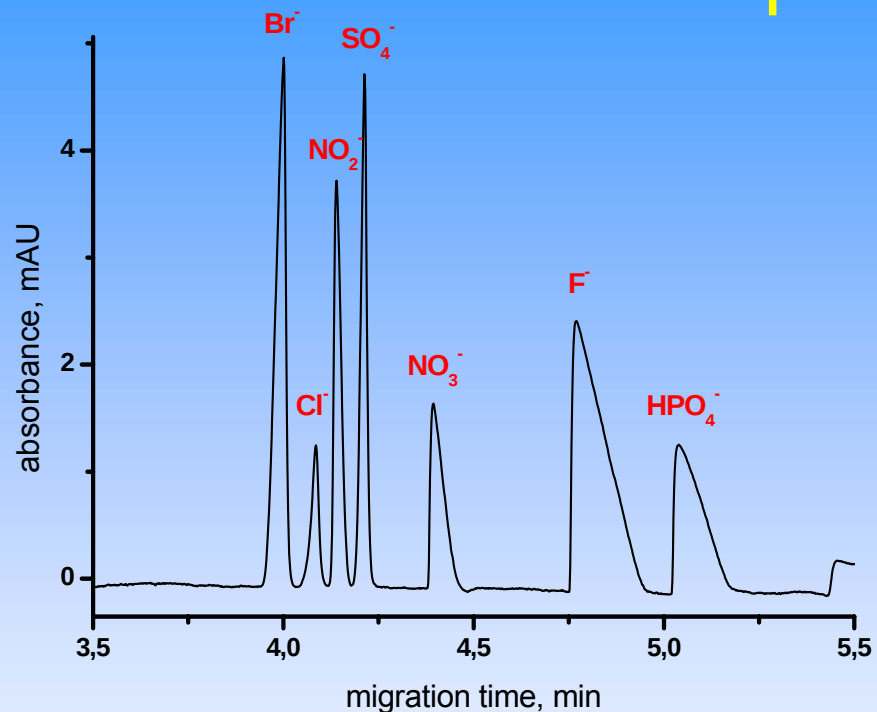
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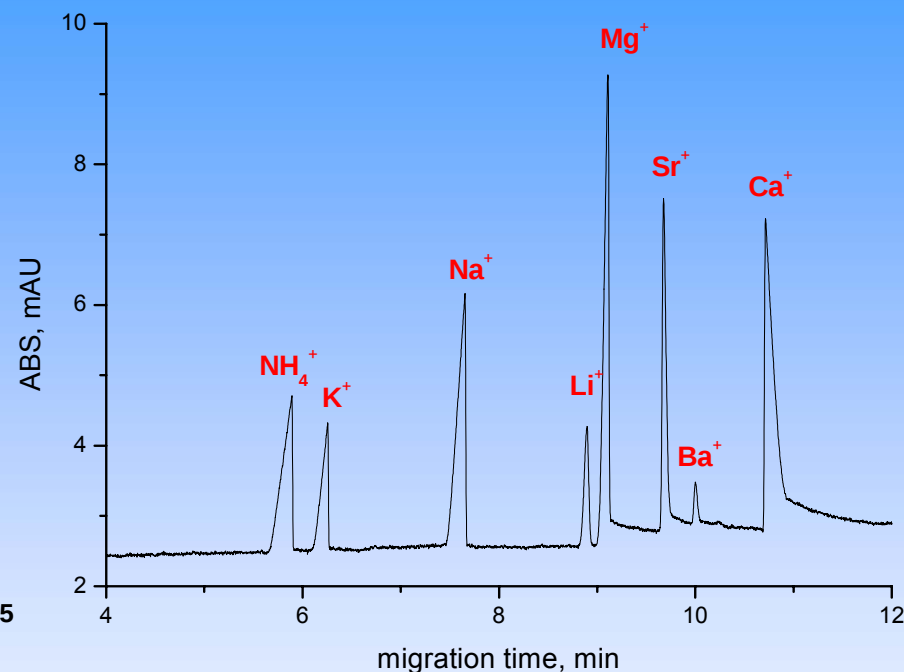
Beer analysis. Inorganic ions in water for beer production.



Buffer: chromate with DEA and CTAB

Sample: inorganic anions

Detection: indirect, at 254 nm



Buffer : benzimidazole with additives

Sample : inorganic cations

Detection : indirect, 254 nm



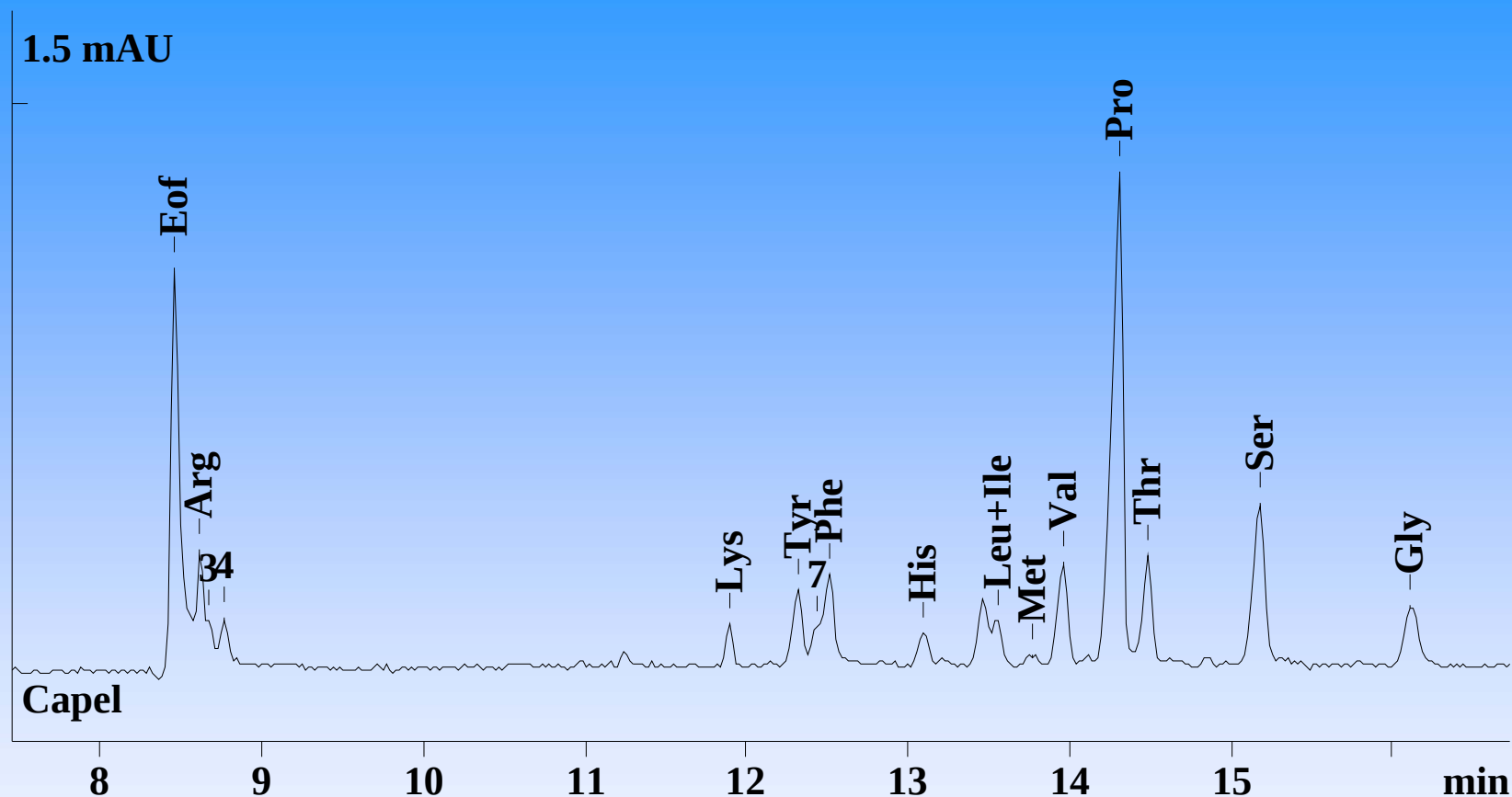
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Aminoacids in beer



Buffer: phosphate pH 7.4 with β -CD

Sample: Beer "X"

Detection: 254 nm after derivatization



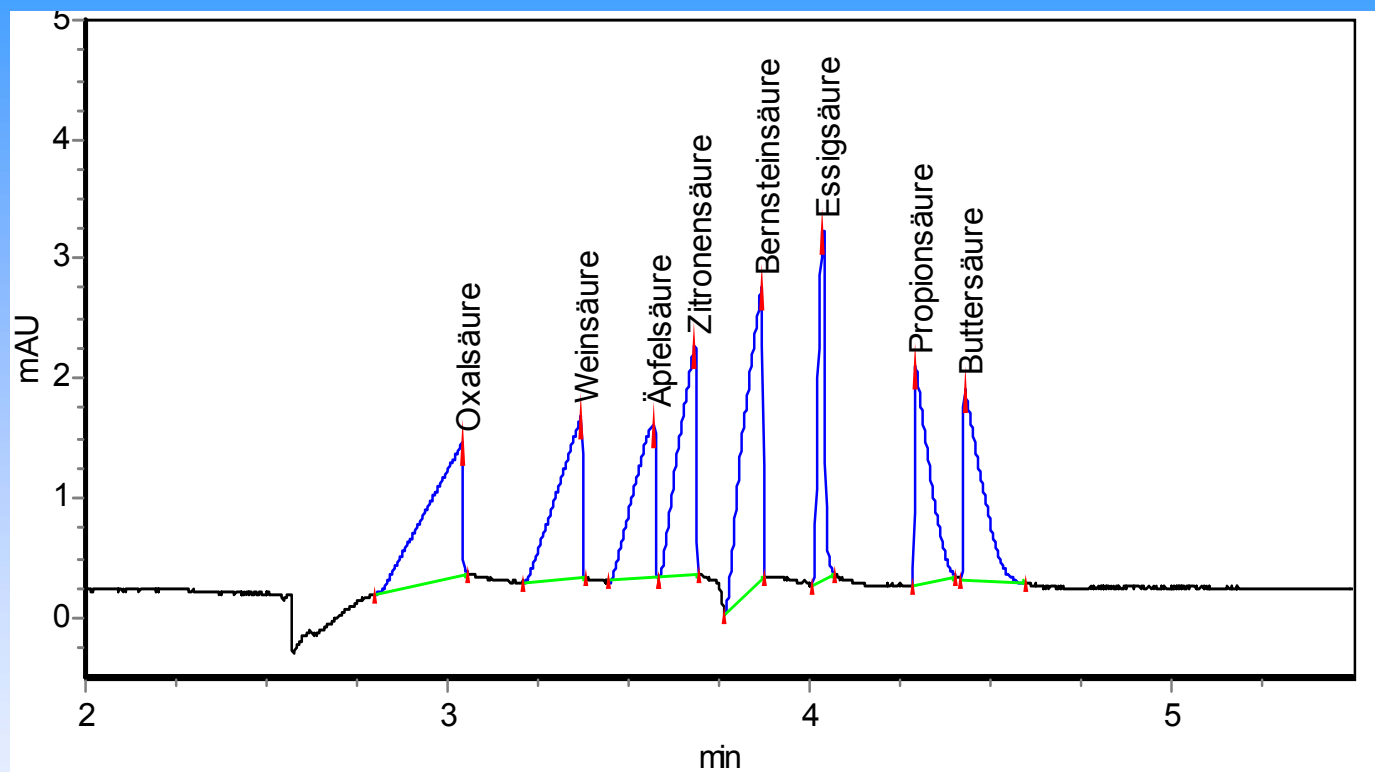
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Organic acids in beer



Sample: 8 organic acids

Buffer: DEA with CTAB



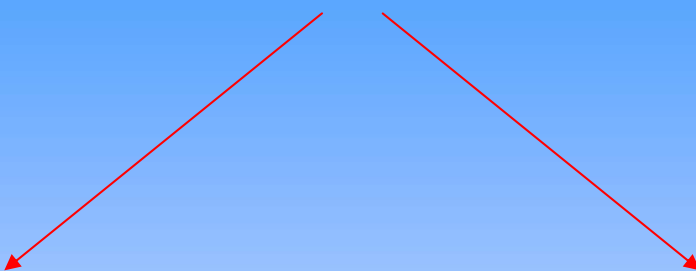
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Environmental analyses by capillary electrophoresis



Inorganic cations and anions in water and soil samples incl.

Cs,⁺ Sr,⁺ Ba,⁺ Li⁺, etc

NO₂⁻, NO₃⁻, F⁻, etc

Pesticides of different classes in water and soil samples incl.

Phenoxycarboxylic acids,

Symmetrical triazines, etc



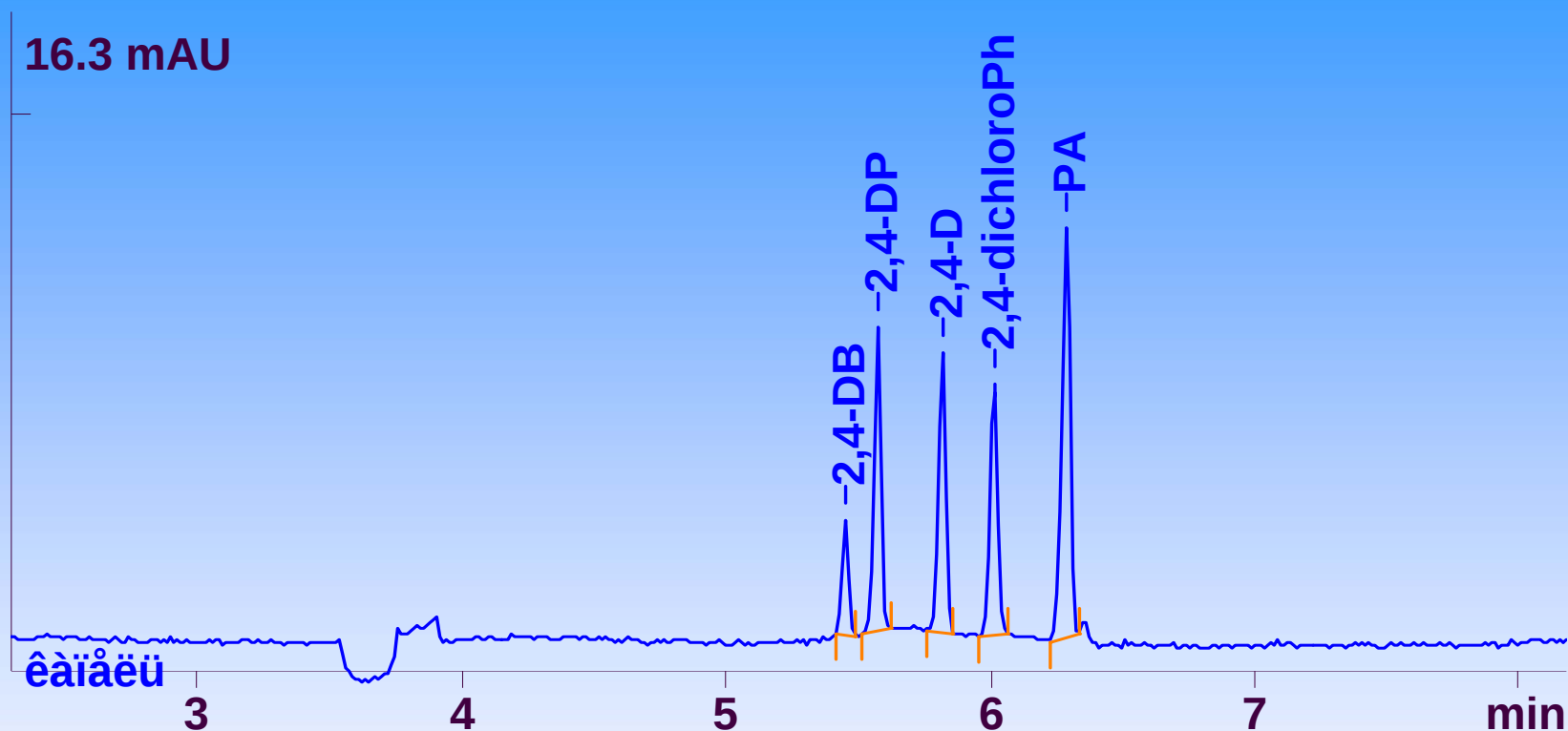
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CE analysis of chlorophenoxyherbicides



Sample: 2,4 -dichlorophenoxybutyric acid
2,4-dichlorophenoxypropionic acid
2,4-dichlorophenoxyacetic acid
phenoxyacetic acid



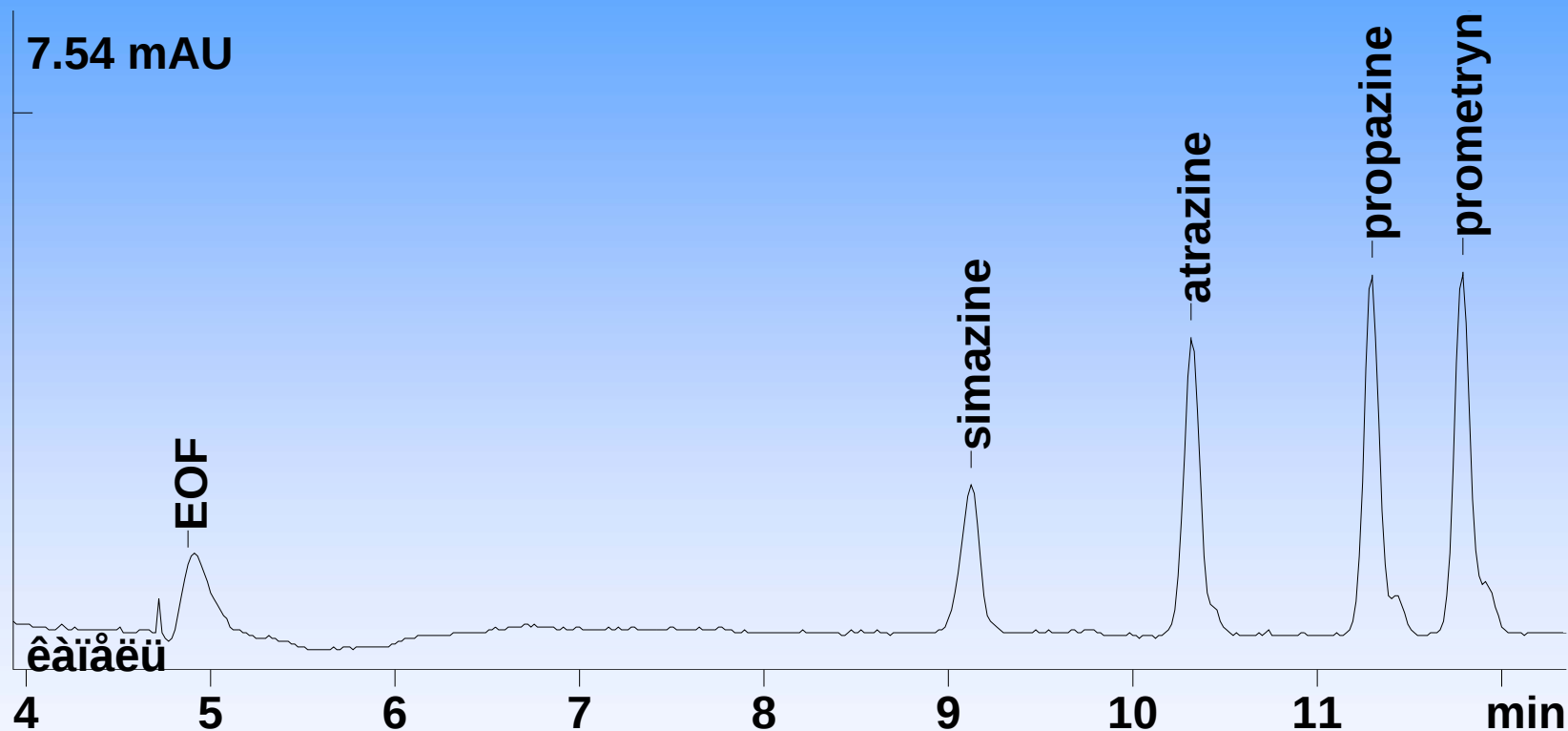
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CE analysis of symmetrical s-triazine herbicides



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Capillary electrophoresis

Important economic considerations

- Very low sample consumption
normally 2 – 10 nL
- Minimum sample volume is very low
normally 20 µL
- Very low reagents consumption
normally 2 – 3 mL per day
- Very low analysis cost



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