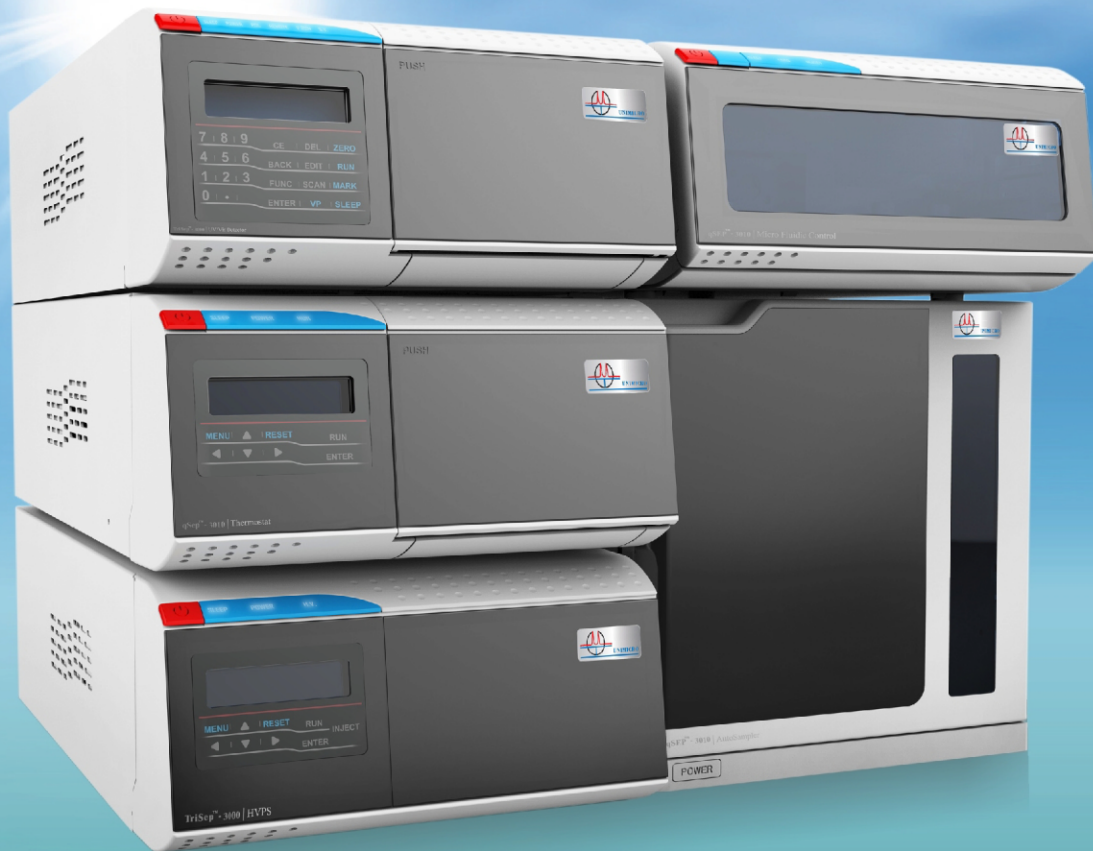
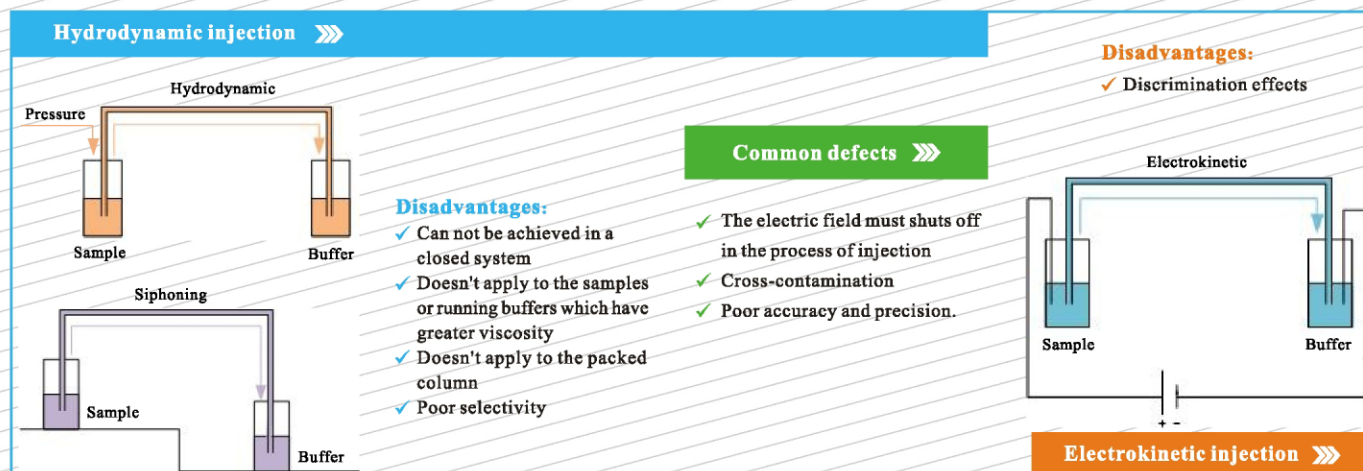




# Fully Automated Quantitative Capillary Electrophoresis



## Disadvantages of conventional injection in CE



## Fully Automated Quantitative Capillary Electrophoresis (qCE) ---New solution and selection

*The qCE system brings a breakthrough change for the traditional CE!*



A quantitative capillary electrophoresis was developed by utilizing a rotary type of nano-volume injector, an auto-sampler, and a thermostat with cooling capacity. The nano-injector with an accurate internal loop provides a new solution for the problem of accurate quantification in CE. The accuracy and precision were greatly improved compared with conventional CE.



## Features

- Using the nano-injector with 4 nL or 10 nL internal loop
- Greatly improved accuracy and precision compared with conventional CE
- The stable, repeatable and reliable results are ensured by a thermostat with cooling capacity
- $\mu$ UV/Vis,  $\mu$ LIF,  $\mu$ ELSD,  $\mu$ ECD and MS can be combined
- Easy-to-operate analysis platform
- Specialized software

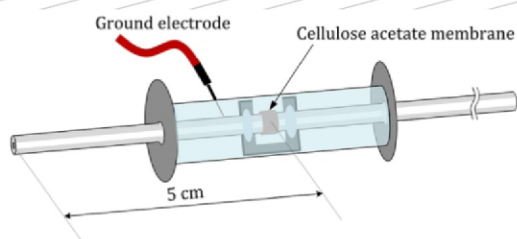
## Introduction of core modules

### Auto sampler

All of the modules of the quantitative CE system were automatically controlled by a computer program.

### Electrical decoupler

- Allowed electrical current to flow between the buffer and capillary but without permeating the buffer and sample to pass through the membrane on the capillary
- Realizing the technology of powering on capillary
- Isolating the injector from the electrical field



### Nano-injector

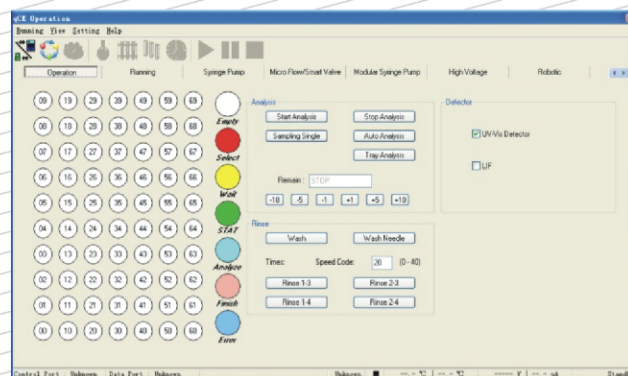
- The injection volume accuracy was guaranteed by the carefully designed nano-injector with an accurate internal loop
- Applies to all types of samples and have no discrimination effects
- Continuous on-line analysis can be performed and have no need to interrupt the process of electrical balance
- Have no cross-contamination between the samples and the buffers
- Valve injection is simple, convenient and safe.

### Thermostat

- Temperature control medium: liquid
- Temperature range: 4~40°C

## Control & data processing software

- Set instrument unit control, data acquisition and processing in one and fully compatible with GLP norms



## Instrument parameters

Test items	Detector parameters	Test items	Detector parameters	Test items	Detector parameters
Overall performances		UV/Vis		High voltage power supply	
Qualitative reproducibility (%)	< 0.8	Range (nm)	190~700	Voltage Range (kV)	0~±30 (Indication error ±2.0%)
Quantitative reproducibility (%)	< 1.0	Precision (nm)	≤1	Current Range	0~100 μA (Indication error ±3.0%)
Solvent delivery system		Repeatability (nm)	≤0.1	Voltage Stability	≤1.5% (In 3 min)
Range (mL/min)	0.001~10.000	Band width (nm)	8	Working environment requirement	
Precision (%RSD)	≤0.1	Baseline noise (AU)	±0.25×10 <sup>-3</sup> AU (Under specified conditions)	Working temperature (°C)	15~30
Accuracy (%)	±2			Storage temperature (°C)	0~40
Auto sampler		Baseline drift (AU/h)	<1×10 <sup>-4</sup> (At room temperature) <3×10 <sup>-4</sup> (2°C below)	Relative humidity (RH)	<90%
Injection precision (%)	<1.0			Power supply	220 V ±10%
Injection accuracy	<2.0	LOD (g/mL)	≤1.0×10 <sup>-6</sup>	Power frequency (Hz)	50±0.5

## Repeatability of qCE system

QC and QA in pharmaceutical industry, separation and purification of proteins, chiral separation, food safety, trace analysis.

Capillary: 50 μm i.d., 360 μm o.d.

Effective length/ Overall Length: 40 cm/60 cm

Injection volume: 10 nL

Wavelength: 220 nm

Voltage: 12 kV

Samples: DMSO (2.2 mg/mL)

Buffer: 10 mM sodium borate (pH 9.20).

Pressurized flow by syringe pump: 2 μL/min.

Split ratio (no electric field) : 8:1

### The RSD of inter-day for four days with DMSO as sample

	tRSD (%)	sRSD (%)
At room temperature	2.27	3.26
20°C	2.00	3.15
15°C	1.74	1.48
10°C	0.90	1.42
5°C	0.84	1.42

### The RSD of intro-day for four days with DMSO as sample

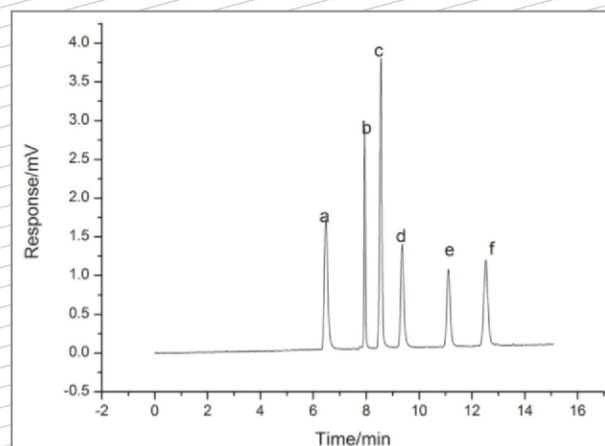
	The first day		The first day		The first day		The first day	
	RSD of time (%)	RSD of peak area (%)	RSD of time (%)	RSD of peak area (%)	RSD of time (%)	RSD of peak area (%)	RSD of time (%)	RSD of peak area (%)
At room temperature	0.99	1.58	0.56	0.93	0.89	1.32	0.63	0.89
20°C	0.61	1.02	0.43	0.41	0.15	1.11	0.41	0.28
15°C	0.45	1.08	0.47	0.63	0.21	0.89	0.17	0.59
10°C	0.44	0.78	0.45	0.69	0.41	0.54	0.45	0.67
5°C	0.44	0.56	0.32	0.79	0.66	0.47	0.44	0.66



## Applications

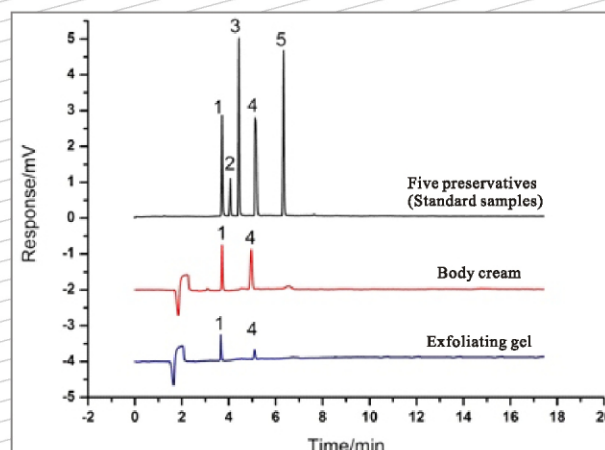
### The baseline separation of six nucleosides

Capillary: 50  $\mu\text{m}$  i.d., 360  $\mu\text{m}$  o.d.  
 Effective length/ Overall length: 40 cm/60 cm  
 Voltage: 15 kV  
 Wavelength: 254 nm  
 Injection volume: 10 nL  
 Temperature: 12  $^{\circ}\text{C}$   
 Buffer: 30 mM sodium borate (pH 9.40)  
 Pressurized flow by syringe pump: 1  $\mu\text{L}/\text{min}$ .  
 Split ratio (no electric field) : 13:1  
 Samples: (a)cytosine (b) 5-fluoro-2' - deoxyuridine (c) adenosine  
 (d) uracil (e) uridine (f) creatinine



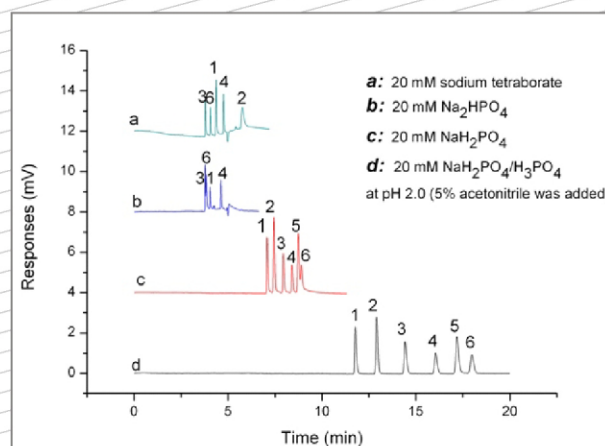
### Determination of five preservatives in cosmetics

Capillary: 50  $\mu\text{m}$  i.d., 360  $\mu\text{m}$  o.d.  
 Effective length/ Overall length: 40 cm/60 cm  
 Buffer: 15 mM sodium borate +100 mM SDS (pH 9.30)  
 Voltage: 20 kV  
 Temperature: 15  $^{\circ}\text{C}$   
 Wavelength: 254 nm  
 Injection volume: 10 nL  
 Pressurized flow by syringe pump: 1  $\mu\text{L}/\text{min}$   
 Split ratio (no electric field): 13:1  
 Samples: 1. MP 2. benzoic acid 3. EP 4. PP 5. BP



### Determination of six synthetic adulterants in weight-loss products

Capillary: 50  $\mu\text{m}$  i.d., 360  $\mu\text{m}$  o.d.  
 Effective length/ Overall length: 40 cm/60 cm  
 Buffer: 20 mM  $\text{NaH}_2\text{PO}_4/\text{H}_3\text{PO}_4$  (pH 2.0)  
 Voltage: 15 kV  
 Pressurized flow by syringe pump: 0.6  $\mu\text{L}/\text{min}$ .  
 Split ratio (no electric field) : 10:1  
 Temperature: 15  $^{\circ}\text{C}$   
 Wavelength: 195 nm  
 Injection volume: 10 nL  
 Samples: 1. pseudoephedrine 2. norepinephrine 3. fenfluramine  
 4. clenbuterol 5. sibutramine 6. amfebutamone





**Unimicro Technologies, Inc.**  
Address: 440 Boulder Court, 100C,  
Pleasanton, CA 94566, USA  
Tel: 925-846-8638  
Fax: 925-401-9548

USA : [Http: //www.unimicrotech.com](http://www.unimicrotech.com)