

Multi-Channel Capillary Electrophoresis System



This note describes the ADELIS multi-channel capillary electrophoresis system. This system supports all CE modes with induced fluorescence and is also suitable for Taylor Dispersion Analysis (TDA).

Popular applications of CE and TDA include :

- DNA and RNA sizing
- QC of antibodies or peptides
- Assay of neurotransmitters
- Characterization of vesicles or nanoparticles

Learn more about **Adelis**

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About Capillary Electrophoresis

Capillary Electrophoresis (CE) is employed to separate molecules in the presence of an electric field. It is used for the analysis of both large and small molecules, organic or inorganic. There are many application fields including environmental, clinical, forensic, biochemical and pharmaceutical analysis. CE has many advantages including superb efficiency (10⁵ to 10⁶ theoretical plates) and high resolution, fast analysis, low sample requirements (a few nL), low buffer consumption, ease of operation, and full automation.

Basic principle of capillary electrophoresis : CE employs a sample vial source and destination vial filled with a background electrolyte (BGE) (buffer). The ends of the capillary are immersed in the source and destination vials with the BGE. The migration of the analytes is initiated by an electric field that is applied between the source and destination vials and supplied to the electrodes by a High Voltage power supply.

The sample can be introduced in the capillary by electrokinetic injection or hydrodynamic injection.

The instrument contains all functional hardware for performing CE separations with four capillaries in parallel.

It includes :

- HV power supply
- Pressure source and pressure control
- Fluorescence Detection
- Liquid handling, including buffer renewal
- Temperature control for capillaries and samples.
- Fraction collection, by pressure or voltage or both.

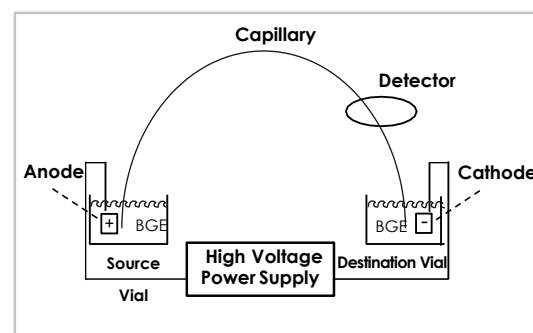


Figure 1 : basic principle of CE

Several modes of CE are possible : Capillary Zone Electrophoresis (CZE, particularly suited for small and charged molecules), Capillary Gel Electrophoresis (CGE, particularly suited for proteins and nucleic acids), Micellar Electrokinetic Chromatography (MEKC, particularly suited for uncharged molecules).

About LEDIF Detection

LED induced fluorescence detection is an in-line detection: a ball lens in contact with the capillary focuses the light source beam into the capillary and collects the emitted fluorescence (Table1).

Capillary ID (µm)	Estimated* Cell Volume (nL)
25	0.2
50	0.8
75	1.8
100	3.1
150	7.1

Table 1:
Estimated LEDIF Cell Volume

* Based on 400 µm window length

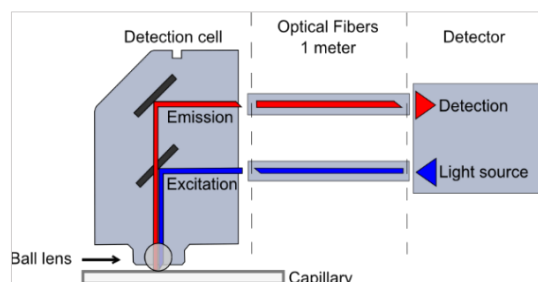


Figure 2 : LEDIF collinear optical arrangement

About Fluid Handling

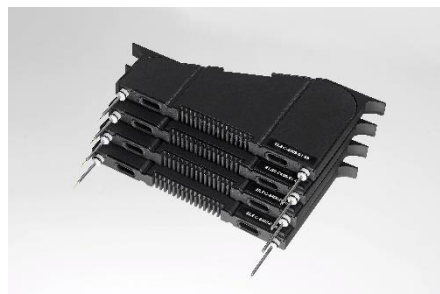
In the ADELIS Multi Channel CE, fluid handling is achieved by a robotic system which enables simultaneously :

- To have up to 8 different reagents on board ; have a complete freedom to master capillary wall charge, pH, viscosity, cross-contamination,... of your assay.
- To renew washing, conditioning, and analysis buffer every sample if needed, for a perfect repeatability.
- To change inlet and outlet solutions within a few seconds, preventing formation of air bubble by evaporation.
- To handle viscous liquids without clogging.
- To prepare next step reagents of the assay in hidden time.

Instrumental Set-Up

Capillary Cassettes

The Multi Channel CE system offers 4 analysis channels in parallel using easy to use cassettes. Electrodes are part of the cassettes, which can be used for up to thousand analyses.



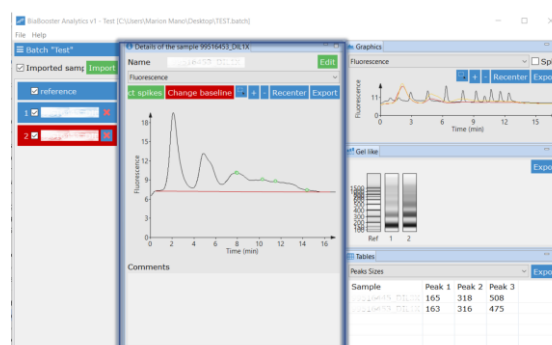
Simple loading and unloading of samples



Select your method and run

Queue up to 96 samples, fully automated process

Analyse results with
the BIABbooster
Analytics Software



Technical specifications

4 capillaries run in parallel	22 or 33 cm long* ID from 25 to 150 µm; OD 360 µm
LED induced fluorescence detection	Fluorescein excitation and emission wavelength**
Size width x depth x height	90 x 60 x 80 cm
Weight	110 kg
Power supply	110-250 V; 50-60 Hz
Max power consumption	1 kW
Capillary voltage	From -30kV to +30kV
Pressure	20 mbar – 12 bar, at inlet, outlet, or both
Capillary temperature	20 – 55 °C
Sample temperature	Dew point
Number of samples	Up to 96
Minimum sample volume	8 µL
Number of different reagents	Up to 8

* For other lengths of capillaries, please, contact us.

** For other wavelengths, please contact us.



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