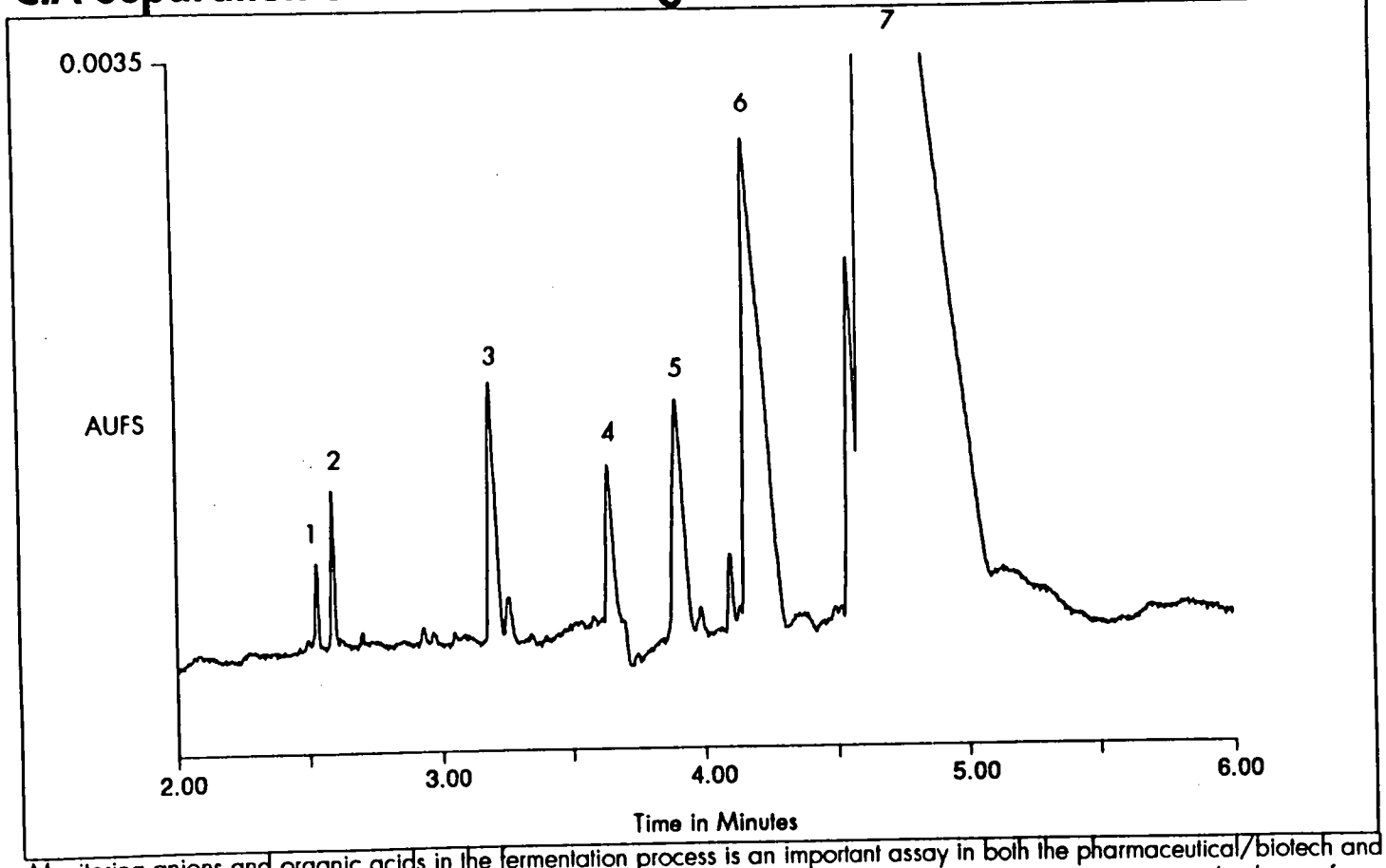
CIA Separation of Anions and Organic Acids in Fermentation Broth



Conditions:

Capillary: AccuSep™ 75 micron by 60 cm

Electrolyte: 5 mM chromate, 0.4 mM OFM, pH 8.0

Voltage: 20KV (negative)

Detection: UV @ 254 nm (indirect)

Injection: 15 second hydrostatic (10 cm)

Sample: 1/100 dilution of filtered fermentation broth

Peak ID:
1) Sulfate
2) Nitrate
3) 2-Ketoglutamic, Succinic
4) Carbonate
5) Acetate, Pyruvate
6) Lactate
7) Glutamate

Monitoring anions and organic acids in the fermentation process is an important assay in both the pharmaceutical/biotech and food markets. Capillary Ion Analysis (CIA) can be used to monitor these types of compounds in starting materials, during fermentation, and in the effluent following the process. The speed of the analysis and selectivity make this technique an excellent choice to provide quantitative feedback results during the process. Competitive techniques such as IC cannot provide the turnaround necessary for process control. Selectivity for coeluting peaks can be manipulated by changing the electrolyte.

Objective:

To monitor anions and organic acids as quantitative feedback for fermentation process control.

Details:

CIA provides quantitative information in a time frame where it is possible to provide process feedback. In addition, it performs the analysis of the sample in a single injection/method, where as IC requires two injections and two separate methods.

System:

Waters CIA Analyzer™
Waters 860 Data Station
Data acquisition rate: 20 pts/sec.
Detector time constant: 0.1 sec.
Sample Preparation: Dilute fermentation broth 1/1000 with Milli-Q® water, filter with Millex®-HA and inject.

References: