CAPILLARY ELECTROPHORESIS AND APPLICATIONS

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Capillary Electrophoresis(CE) is today the most rapidly developing area in separation science. The fast and effective separation given by CE, its on-line detection system, its small sample(1-50nL) requirements, and the diverse separation modes have greatly contributed the large domain of applications.

In CE, separation takes place inside silica capillary tubes with internal radius between 20-75μm. The two ends of the capillary are immersed into two buffer compartments that also contain the electrodes. The sample is injected at one end of capillary, is separated under an applied high voltage (up to 30kV), and is detected at the other end of the capillary. Due to the double layer that forms on the internal surface of the capillary by the surface ionization of silica, an electroosmotic flow towards the cathode occurs under the applied voltage. Under this electroosmotic flow, all injected ionic and non-ionic material are diferently driven towards the cathode, thus separated and on-line detected.

Capillary zone electrophoresis (CZE), capillary gel electrophoresis (CGE), capillary electrochromatography (CEC), and micellar electrokinetic chromatography (MEKC) are the common variants of CE:

This paper presents a review of our researches on CE: The research results are organized into four major sections-The analysis of fatty acids by MECK, the use of polymers in CE, separation of metal ions by CE, and affinity analysis by CE.