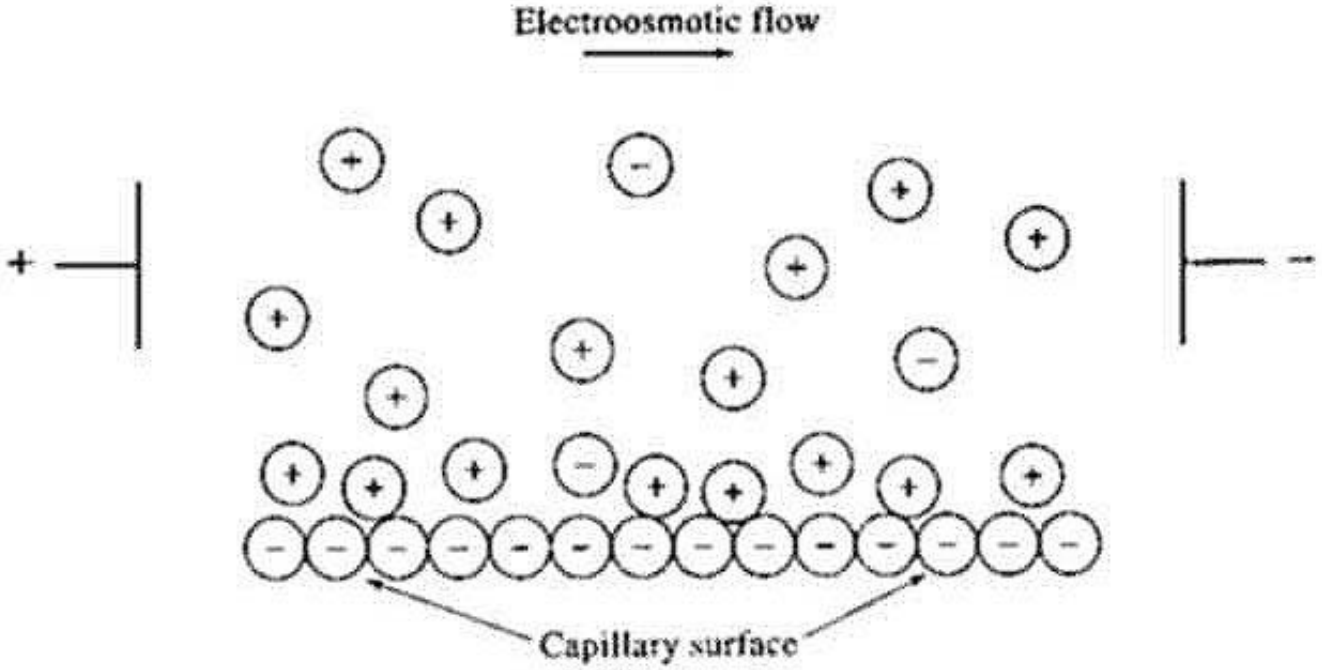

Figure 30-2 Charge distribution at a silica/capillary interface and resulting electroosmotic flow. *(From A. G. Ewing, R. A. Wallingford, and T. M. Olefirowicz,* Anal. Chem., *1989,* 61, *294A. With permission.)*

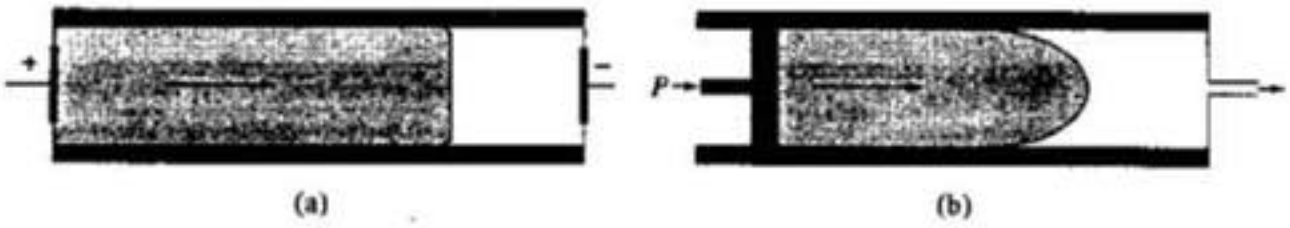

Figure 30-3 Flow profiles for liquids under (a) electroosmotic pressure and (b) hydrodynamic pressure.

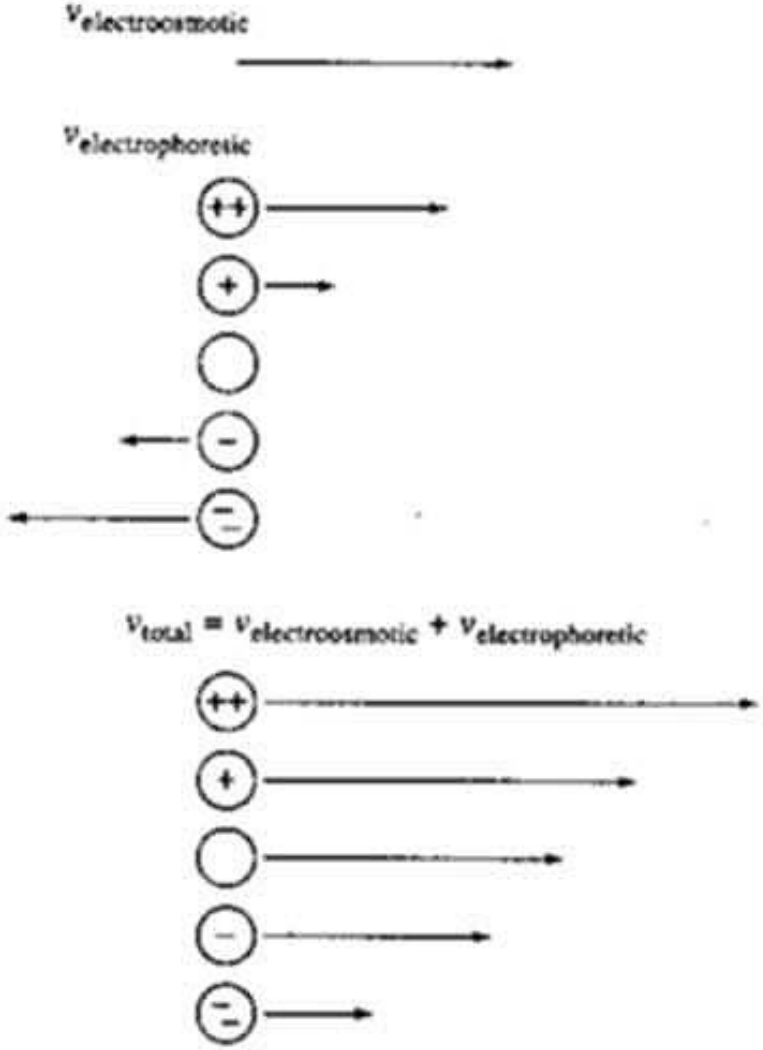

Figure 30-4 Velocities in the presence of electroosmotic flow. The length of the arrow next to an ion indicates the magnitude of its velocity; the direction of the arrow indicates the direction of motion. The negative electrode would be to the right, and the positive electrode to the left of this section of solution.

TABLE 30-1 Detection Modes Developed for Capillary Electrophoresis[a]

Detection Principle	Representative Detection Limit[b] (moles detected)
Spectrometry	
Absorption[c]	10^{-15}–10^{-13}
Fluorescence	
Precolumn derivatization	10^{-17}–10^{-20}
On-column derivatization	8×10^{-16}
Postcolumn derivatization	2×10^{-17}
Indirect fluorescence	5×10^{-17}
Thermal lens[c]	4×10^{-17}
Raman[c]	2×10^{-15}
Mass spectrometry	1×10^{-17}
Electrochemical	
Conductivity[c]	1×10^{-16}
Potentiometry	Not reported
Amperometry	7×10^{-19}
Radiometry[c]	1×10^{-19}

[a]From A. G. Ewing, R. A. Wallingford, and T. M. Olefirowicz, *Anal. Chem.*, **1989**, *61*, 292A. With permission.
[b]Detection limits quoted have been determined with a wide variety of injection volumes that range from 18 pl to 10 nL.
[c]Mass detection limit converted from concentration detection limit using a 1-nL injection volume.

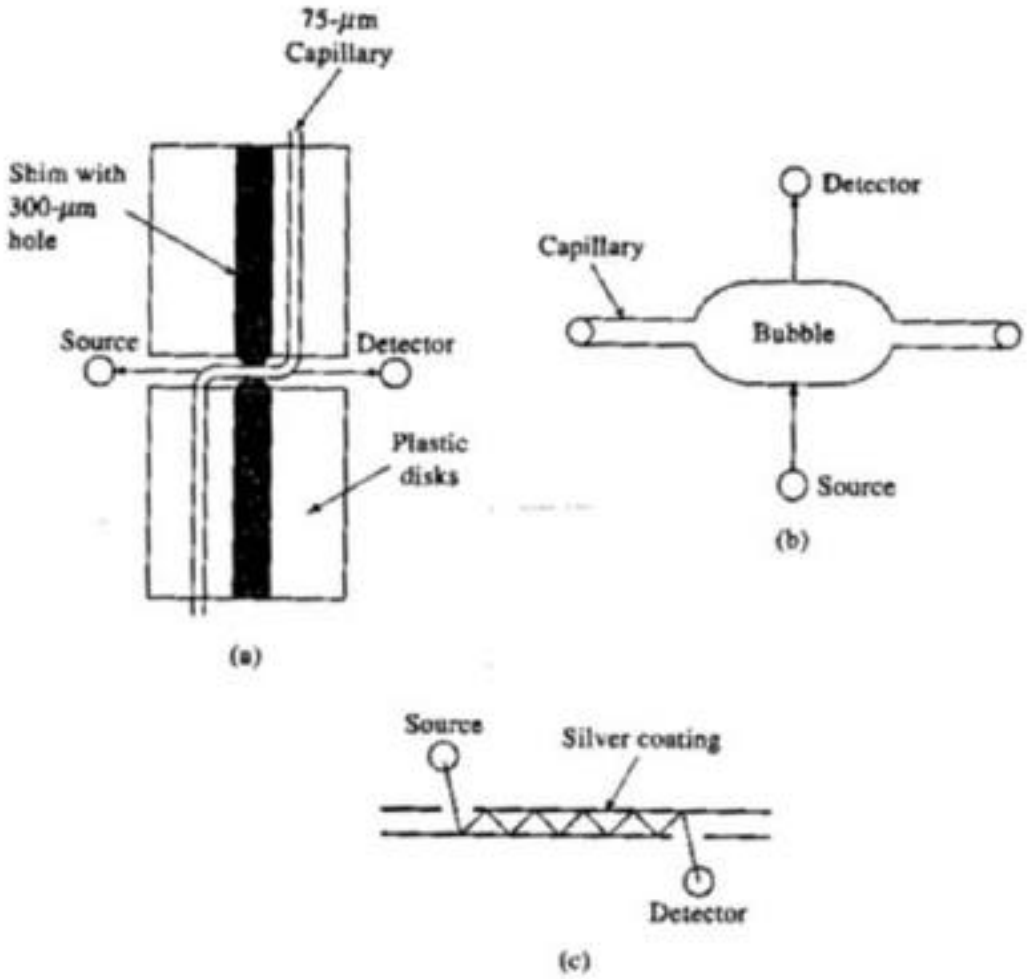

Figure 30-5 Three types of cells for improving the sensitivity of detection by absorbance measurements: (a) the 3-mm z cell, (b) the 150-μm bubble cell, (c) the multireflection cell.

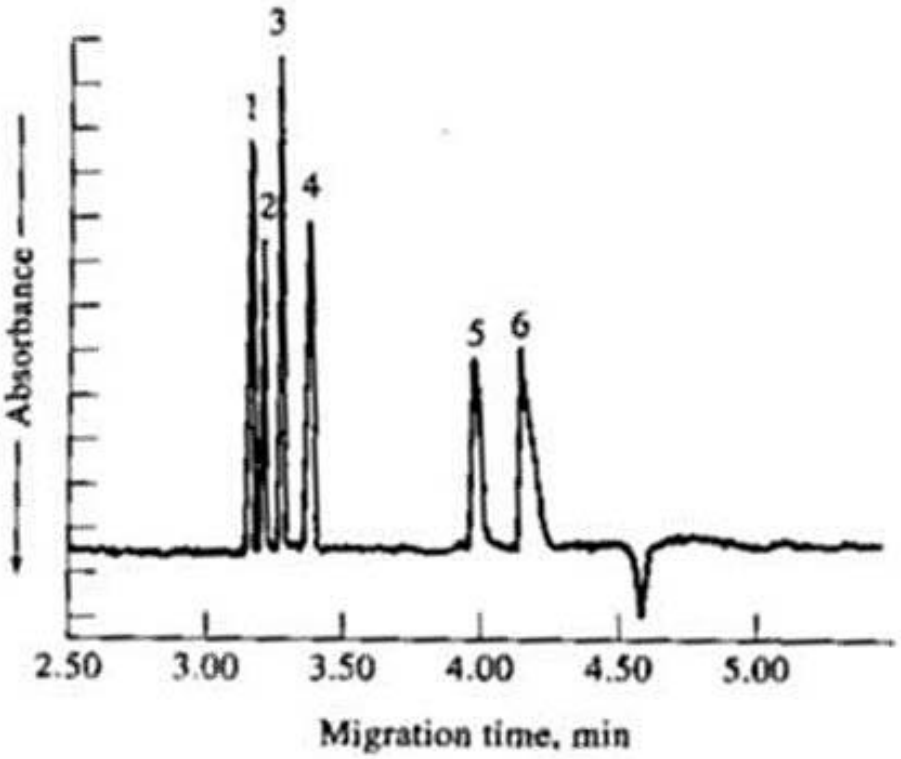

Figure 30-6 Electropherogram of a six-anion mixture by indirect detection with 4-nM chromate ion at 254 nm. Peak: (1) bromide (4 ppm), (2) chloride (2 ppm), (3) sulfate (4 ppm), (4) nitrate (4 ppm), (5) fluoride (1 ppm), (6) phosphate (6 ppm).

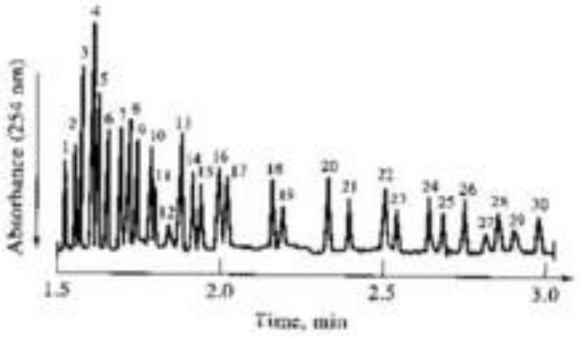

Figure 30-10 Electropherogram showing the separation of 30 anions. Capillary internal diameter: 50 μm (fused silica). Detection: indirect UV, 254 nm. Peaks: 1 = thiosulfate (4 ppm), 2 = bromide (4 ppm), 3 = chloride (2 ppm), 4 = sulfate (4 ppm), 5 = nitrite (4 ppm), 6 = nitrate (4 ppm), 7 = molybdate (10 ppm), 8 = azide (4 ppm), 9 = tungstate (10 ppm), 10 = monofluorophosphate (4 ppm), 11 = chlorate (4 ppm), 12 = citrate (2 ppm), 13 = fluoride (1 ppm), 14 = formate (2 ppm), 15 = phosphate (4 ppm), 16 = phosphite (4 ppm), 17 = chlorite (4 ppm), 18 = galactarate (5 ppm), 19 = carbonate (4 ppm), 20 = acetate (4 ppm), 21 = ethanesulfonate (4 ppm), 22 = propionate (5 ppm), 23 = propanesulfonate (4 ppm), 24 = butyrate (5 ppm), 25 = butanesulfonate (4 ppm), 26 = valerate (5 ppm), 27 = benzoate (4 ppm), 28 = *l*-glutamate (5 ppm), 29 = pentanesulfonate (4 ppm), 30 = *d*-gluconate (5 ppm). *(From W. A. Jones and P. Jandik, J. Chromatogr., 1991, 546, 445. With permission.)*

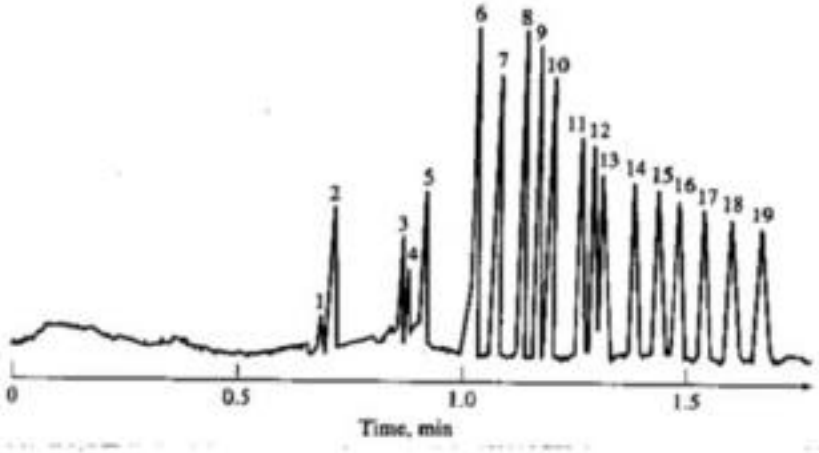

Figure 30-11 Separation of alkali, alkaline earths, and lanthanides. Capillary: 36.5 cm × 75-μm fused silica, +30 kV. Injection: hydrostatic, 20 s at 10 cm. Detection: indirect UV, 214 nm. Peaks: 1 = rubidium (2 ppm), 2 = potassium (5 ppm), 3 = calcium (2 ppm), 4 = sodium (1 ppm), 5 = magnesium (1 ppm), 6 = lithium (1 ppm), 7 = lanthanum (5 ppm), 8 = cerium (5 ppm), 9 = praseodymium (5 ppm), 10 = neodymium (5 ppm), 11 = samarium (5 ppm), 12 = europium (5 ppm), 13 = gadolinium (5 ppm), 14 = terbium (5 ppm), 15 = dysprosium (5 ppm), 16 = holmium (5 ppm), 17 = erbium (5 ppm), 18 = thulium (5 ppm), 19 = ytterbium (5 ppm). *(From P. Jandik, W. R. Jones, O. Weston, and P. R. Brown, LC-GC, 1991, 9, 634. With permission.)*