

Achievements and Trends in Analytical Chemistry

Speaker: Alfred Steinbach, Metrohm AG



In routine chemical analysis, the predominant requirement involves a higher sample throughput with improved detection limits and reduced personnel costs. Straightforward analysis systems such as titration, ion chromatography, and voltammetry are powerful methods for rapidly and reliably determining a wide range of analytes in different matrices. Bromate and uranium(VI) in drinking and mineral water, for example, can be rapidly determined without any sample preparation and in compliance with the valid standards. The methods can be easily automated and adapted to suit complex sample matrices.

More complex samples, however, usually have to undergo labor-intensive sample preparation to enable the analytes to be determined without interference. Often an organic matrix prevents separation and detection, or an ion concentration is too high or too low which requires dilution or preconcentration. As a representative of an inline sample preparation technique that can be automated, the inline dialysis of a dairy product demonstrates the quantitative and rapid separation of the carbohydrates to be determined from the interfering protein matrix. If the target analytes are present in bound form in liquids or solids, or present in the atmosphere in the form of a gas or aerosol, then automatable pyrolysis units and wet rotating denuders (WRD) or steam-jet aerosol collectors (SJAC) are available for coupling to an analyzer.

This presentation looks at different sample preparation techniques that are coupled to titrators, ion chromatographs, or VA analyzers.

About the speaker: Dr. Alfred Steinbach is technical writer in the Marketing Department of Metrohm AG, based in Herisau, Switzerland. He obtained his Masters in nuclear chemistry from the University of Cologne, Germany, and his PhD in environmental and analytical biogeochemistry from the University of Hamburg, Germany. He has published several journal articles, mainly in the environmental biogeochemistry area. Before obtaining his Ph.D. and joining Metrohm AG in 2006, he carried out research in nuclear, analytical and environmental chemistry and worked as production manager for polymer emulsions as well as animal feeds and premixes at BASF Venezolana S.A. in South America.

