

## **Analytical Chemistry in Small-Volumes at Low-Concentration**

J. M. Ramsey  
Oak Ridge National Laboratory  
Oak Ridge, TN 37831

One of the goals of the analytical chemist has always been to push the concentration detection limits to lower values. More recently there has been interest in reducing the absolute mass of material required for detection. The later scenario usually involves the analysis of very small volumes of material for low abundance species. A number of relevant problems require such capabilities, e.g., aerosol analysis or quantification of many cellular species. We have been developing a number of technologies that allow the convenient manipulation of nanoliter to picoliter volumes with high dexterity. In addition detection methodologies including optical fluorescence and electrospray mass spectrometry have been used for quantification of materials on these small volumes. An overview of these developments will be presented.

Research sponsored by the Division of Chemical Sciences, Geosciences, and Biosciences, Office of Basic Energy Sciences, U.S. Department of Energy, under contract DE-AC05-00OR22725 with Oak Ridge National Laboratory, managed and operated by UT-Battelle, LLC.

"The submitted manuscript has been authored by a contractor of the U.S. Government under contract No. DE-AC05-00OR22725. Accordingly, the U.S. Government retains a nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or allow others to do so, for U.S. Government purposes."

