EVALUATION OF ANALYTICAL TECHNIQUES FOR THE DETERMINATION OF TRACE ELEMENTS IN COAL, FLY ASH, FUEL OIL, AND GASOLINE - Darryl J. von Lehmden, Robert H. Jungers, and Robert E. Lee, Jr., Environmental Protection Agency, National Environmental Research Center, Research Triangle Park, North Carolina 27711.

The Environmental Protection Agency has initiated a program of routine monitoring of fuels and related emissions for elements in trace quantities (at the ppb level). Analytical method comparisons are underway for twenty-six elements to determine optimal analytical schemes for selected fuel and emission matrices. Included in the elements under investigation are mercury, beryllium, lead, cadmium, arsenic, vanadium, manganese, chromium, and fluorine. Methods compared include neutron activation analysis, atomic absorption, spark source mass spectrometry, optical emission spectrometry, anodic stripping voltammetry, and x-ray fluorescence. The results of the evaluation program are evaluated with respect to accuracy and precision. The results from an interlaboratory comparison for trace elements in coal, fly ash, residual fuel oil, and gasoline are used for the evaluation of the various methods employed. The interlaboratory comparison for the twenty-six trace elements showed that for at least seven trace elements in each of the four matrices the reported concentration ranges were greater than one order of magnitude. The large range in reported results points out the need for standard reference materials certified in trace elements which are essential for method evaluation and quality control. A program to provide standard reference materials for trace elements in coal, fly ash, residual fuel oil, and gasoline will be described.