CleanAir

CASE STUDY

Laboratory Evaluation of EPA Methods 26 and 26A for Analysis of Halogens and Halides in Stack Gas

Background

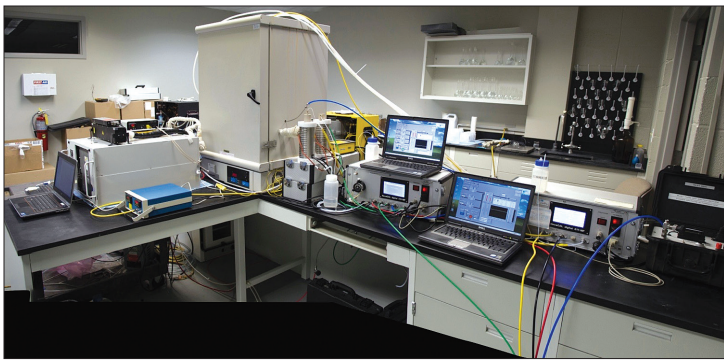
The Electric Power Research Institute (EPRI) sponsored research to evaluate the performance of U.S. EPA Methods 26 and 26A when used for coal-fired power plant flue gases. Using a laboratory setup, both methods were evaluated for precision and bias while manipulating real field variables.

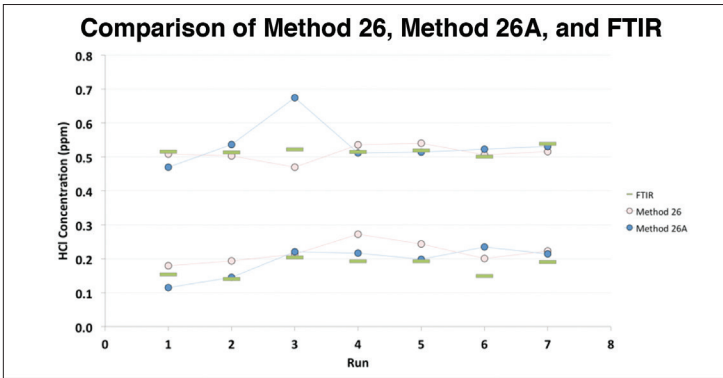
CleanAir's Approach

CleanAir developed a flue gas simulation system to deliver a gas matrix representative of a coal-fired power plant's flue gas to three parallel sampling ports. Duplicate wet method trains were used in each run, along with a Fourier Transform Infrared Spectroscopy (FTIR) instrument. Using a Design of Experiment (DOE) setup, a test matrix was executed to evaluate the performance of these methods, while varying such test parameters as gas constituent concentrations, impinger pH, train preconditioning, sampling time duration, type of fly ash, filter box temperature, and sample transport materials. In addition, heavy scrutiny was placed on laboratory techniques involved with ion chromatography (IC) analysis for chloride content of the sample. Testing took place over 18 months.

Results

The results of this study gave CleanAir and industry, in general, great insights as to the performance of the wet methods. Overall bias and precision was determined, as well as any additional bias associated to any specific process parameters. An overall method detection limit was determined, as well as best-practice recommendations related to field procedure. A small comparative study was executed for laboratory IC analysis amongst a handful of accredited labs, and glassware-cleaning procedures were evaluated. Being public, this report gives significant guidance to facilities and testers alike for proper and representative sampling of HCl.





7 Runs at each concentration: M26, M26A, FTIR for each run

Summary

CleanAir performed EPRI-sponsored research in the laboratory to evaluate the overall performance of the wet methods for HCl measurement while simulating real flue gas matrix conditions.