

THE USE OF SORBENT TRAPS AS A REFERENCE METHOD FOR MERCURY MEASUREMENT

Dennis L. Laudal
Energy & Environmental Research Center

Eric Roland
Reliant Energy

Charles Dene
Electric Power Research Institute

In June 2005, the U.S. Environmental Protection Agency (EPA) finalized the Clean Air Mercury Rule (CAMR). As part of the rule, all coal-fired power plants will be required to do continuous mercury measurements. This will require that an annual Relative Accuracy Test Audit (RATA) be done. The only reference methods currently allowed are the wet chemistry methods Ontario Hydro (OH) Mercury Speciation Method (ASTM D6784-02) and EPA Method 29.

To complete a RATA using the OH method or EPA Method 29 will require nine **valid** dual trains. To be valid, each of the dual trains must have a relative difference of 10% or less. This will be a challenge and very expensive. It would be much more desirable to have a simpler reference method, such as sorbent traps, so that the results can be obtained quickly and cheaply. This presentation presents the results from testing at Reliant Energy's Portland Station (burns a low to medium sulfur eastern bituminous coal). The project was designed to compare mercury measurement results using sorbent traps to the OH method under a RATA scenario. Three different conditions were tested.

The results from twelve paired OH method trains were compared to the data collected from 12 sets of sorbent traps samples using a quadprobe. For each set of 4 sorbent traps two were analyzed in the field using the Ohio Lumex mercury analyzer and two analyzed by Frontier Geosciences using EPA Method 1631. All tests were done simultaneously and were 2 hours. The results for the first two tests series are shown in Tables 1. When compared to the OH method both sorbent trap analysis methods passed a RATA for these two tests.

Table 1: RATA Results From Test Series 1 and 2.

Analysis	Test Series 1		Test Series 2	
	Average, $\mu\text{g}/\text{m}^3$	Relative Accuracy, %	Average, $\mu\text{g}/\text{m}^3$	Relative Accuracy, %
OH Method	8.47	-----	2.19	-----
Frontier GeoSciences	8.18	5.07	2.05	17.00
Ohio Lumex	9.47	18.17	2.14	9.24
CMM	-----	-----	2.43	17.03

For the third test series a very high level of mercury control was in place and the average mercury concentration in the flue gas was $0.19 \mu\text{g}/\text{m}^3$. At this level it was not possible to obtain

9 valid sets of OH method results. It should be noted that ASTM D6784-02 indicates a lower limit of $0.5 \mu\text{g}/\text{m}^3$. However, it was possible to obtain valid data sets using the sorbent traps.

Before the sorbent trap method can be used as a reference method the following are needed:

- Similar tests need to be completed at facilities burning other types of coal.
- QA/QC protocols must be established for the Ohio Lumex or similar instruments that are in line with EPA Method 1631.
- The EPA must recognize the sorbent trap method as a valid reference method and establish reference method protocols for sorbent traps similar to the OH method.