

## 1. What pollutant(s) does this method seek to measure?

Method 8 is designed to separate and measure sulfuric acid/sulfur trioxide emissions and sulfur dioxide emissions.

## 2. Was it developed for a specific source category?

Method 8 was developed specifically for measuring sulfur oxide emissions from sulfuric acid manufacturing plants. These sources have relatively clean and dry emission streams with few or no interferences. Method 8 works very well for these kinds of sources.

## 3. Is it applicable to other sources?

Because Method 8 is the only method that EPA has published for measuring sulfuric acid/sulfur trioxide emission, it has been applied to many source categories other than the one for which it was developed. It may not work very well for some source categories and may not be appropriate for measuring sulfur oxide emissions from them. It should not be used to measure sulfuric acid/sulfur trioxide from the following kinds of sources:

1. Those sources that have significant emissions of solid sulfates that are water soluble. Solid sulfates are compounds like sodium sulfate.
2. Those sources that have significant emissions of sulfur dioxide and ammonia.

## 4. How are samples collected?

Method 8 uses a manual sampling train similar to the one described in EPA Method 5 to collect particulate matter samples. The principle difference is that the filter in Method 8 is not between the probe and first impinger but between the first and second impingers. In addition, there is no requirement to heat the filter. The Method 8 sample train begins with a glass probe to transfer the sample from the stack to the first impinger. The first impinger contains an 80% solution of isopropyl alcohol in water. This impinger is followed by a glass fiber filter. The filter is followed by two impingers each containing a 3% solution of hydrogen peroxide in water, and empty impinger, and an impinger containing silica gel. The impingers are followed by a combination pump and meter box system to pull sample from the stack at a controlled rate and measure the volume.

The stack is divided into a predetermined number of equal areas. The sample is collected from the centroid of each of these areas for an equal length of time at a sampling rate that is isokinetic with the stack flow rate at the point of sample collection. As the sample passes through the sample train the sulfuric acid/sulfur trioxide is collected in the first impinger and on the filter behind the first impinger. The sulfur dioxide continues past the first impinger and filter and is collected in the second and third impingers. Samples are typically collected for a total period of an hour.

## 5. What technique is used for sample analysis?

Method 8 physically separates the sulfuric acid/sulfur trioxide from the sulfur dioxide in the sample train. At the conclusion of the sample collection, the sulfuric acid/sulfur trioxide sample is contained in the isopropyl alcohol solution recovered from the first impinger and the backup filter. The sulfur dioxide sample is contained in the hydrogen peroxide solution recovered from the impingers two and three. Once the sulfur oxides are collected, they are in the chemically identical form of a sulfuric acid solution. The analysis for both sample fractions is removed and placed in a flask. Isopropyl alcohol is added to the sample to adjust the concentration of the alcohol to at least 80%. A few drops of a solution of Thorin is added to the sample, and the sample is titrated with a 0.01 N solution of barium perchlorate until the color of the sample changes from straw yellow to salmon pink.

**6. Is the method usually completed in the field or after the sample is returned to laboratory?**

The analysis can be performed at the test site or the sample may be returned to the laboratory for analysis. There is no requirement on how quickly the sample must be analyzed because the samples are chemically stable for long periods of time. However, good laboratory practice would require that the samples be analyzed as soon after collection as practical.