

## ARB METHOD 3: Gas Analysis for Carbon Dioxide, Oxygen, Excess Air, and Dry Molecular Weight

### Principle

A gas sample is extracted from a stack, by one of the following methods: (1) single-point, grab sampling; (2) single-point, integrated sampling; or (3) multi-point, integrated sampling. The gas sample is analyzed for percent carbon dioxide (CO<sub>2</sub>), percent oxygen (O<sub>2</sub>), and, if necessary, percent carbon monoxide (CO). If a dry molecular weight determination is to be made, either an Orsat or a Fyrite analyzer or analyzers specified in Method 100 may be used for the analysis; for excess air or emission rate correction factor determination, an Orsat analyzer or analyzers specified in Method 100 must be used.

### Applicability

This method is applicable for determining CO<sub>2</sub> and O<sub>2</sub> concentrations, excess air, and dry molecular weight of the sample from a gas stream of a fossil-fuel combustion process. The method may also be applicable to other processes where it has been determined that compounds other than CO<sub>2</sub>, O<sub>2</sub>, CO, and nitrogen (N<sub>2</sub>) are not present in concentrations sufficient to affect the results.

Other methods, as well as modifications to the procedure are also applicable for some or all of the above determinations. Examples of specific methods and modifications include: (1) a multi-point sampling method using an Orsat analyzer to analyze individual grab samples obtained at each point; (2) a method using CO<sub>2</sub> or O<sub>2</sub> and stoichiometric calculations to determine dry molecular weight and excess air; (3) assigning a value of 30.0 for dry molecular weight, in lieu of actual measurements, specifically for processes burning natural gas, coal, or oil. These methods and modifications may be used, but are subject to the approval of the Control Agency's Authorized Representative.

### Contacts

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