

Interpoll Laboratories, Inc.
Dan Despen

Iowa AWMA Conference
VOC Discussion

Introduction

Share information and opinions on the measurement of volatile organic compounds (VOC). Start with the definitions that are available through various resources. Move into the principal VOC test methods that are used in industry. Compare and contrast the methods. Conclude with summary of the limitations of the current definitions and application of the methods.

Definitions

- Organic
- VOC
- EPA – CFR
- EPA – Other pubs
- Academia
- Common Sense (volatile is an adjective – it's there modifying organic compound for a REASON)

“as” carbon

- Use only the molecular weight of carbon

“as” VOC

- Use molecular weight of whole molecule

Interesting observation: EPA Method 202 (particulate/PM-10 back half) frequently contains organic material. The opinion that any organic material that passes through a filter is VOC contradicts the assumption that it is also condensable particulate.

Tests Methods

EPA Method 25A

- Uses flame ionization detector to
- Analyzes whole gas sample continuously
- Detection limit

EPA Method 25

- Also uses FID, but after conversion
- Sample collected as two integrated fractions
- Detection limit

EPA Method 18

- Many options provided
- Gas chromatographic approach with appropriate detectors
 - FID
 - ECD
 - FPD
 - MS
- Detection limit

EPA Method 320

- Analyses a discrete (time-sliced) fraction of gas
- May be conditioned in some manner
- Uses an infrared detector
- Detection limit

Compare and contrast methods

- Explain difference between “as carbon” and “as VOC” in the method context
- What is response factor and how does it factor in
- Example using ethanol as single component

Summary

The “problem” with measuring VOC starts off with one of definition. We do not have concurrence on what we are attempting to measure. The methods do not provide the answer – they measure “something” which is defined by the collection, calibration, analysis, and data reduction procedures specified in each method (use Method 5 as an example).