Question 9.31

Topic: Zero-level gases for O_2 Analyzers

Question: Question 9.1 describes "zero air material," which may be used in lieu of a zero-level EPA Protocol gas for daily calibrations of SO_2, NO_x and CO_2 monitors. However, "zero air material" is not appropriate for the zero-level calibration of an O_2 analyzer. What types of zero material(s) may be used to calibrate an O_2 analyzer?

Answer: The following calibration materials may be used to zero an O_2 analyzer:

(1) A "zero-level" EPA Protocol gas, consisting of O_2 (at a concentration > 0.0% but <= 20.0% of the span value) in nitrogen; or

(2) High-purity nitrogen, certified by the vendor to contain$_2$:

_ Concentrations of SO_2, NO_x, or total hydrocarbons _ 0.1 parts per million (ppm);

_ A CO concentration <= 1 ppm;

_ A CO_2 concentration <= 400 ppm; and

_ An O_2 concentration < 500 ppm (0.05% O_2); or

(3) An EPA protocol gas cylinder containing NO_x in oxygen-free nitrogen. Note that the "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards" requires that nitrogen oxide standards be blended only with oxygen-free nitrogen containing < 0.5 ppm of oxygen; or

(4) Any other EPA Protocol gas mixture for which O_2 is either not listed as a component of the mixture on the vendor's certificate of analysis or, if listed, has a concentration < 500 ppm (0.05% O_2); and nitrogen, with a certified purity of 99.95% or better is used as the balance gas.

References: § 72.2; Question 9.1; "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards" (EPA-600/R-97/121; Research Triangle Park, NC; September, 1997)

History: First published in the October 2003 Revised Manual; revised in 2013 Manual