March 28, 2019

To: Specialty Gas Producers

From: Solomon Ricks, EPA – OAOPS Protocol Gas Verification Program Lead

Bob Wright, EPA – ORD Air and Energy Management Division

Subject: Request for Long-Term Stability Data for NO₂ Gas Mixtures

In October 2017, the attached memoranda were sent to EPA Protocol Gas vendors and to EPA Regions, States, and local agencies concerning NO₂ EPA Protocol Gases. There is a need for such calibration gases because of the recent development of direct-reading NO₂ ambient air quality analyzers and their use for regulatory measurements. Current EPA guidance suggests that these analyzers should be calibrated using gas-phase titration via the use of the EPA Protocol Gas NO. Currently, NO₂ gas mixtures could be used for quality control checks between such calibrations, although there are concerns about their long-term stability. Because of this stability issue, the EPA has not included NO₂ gas mixtures among those gas mixtures that can be certified as EPA Protocol Gases using the EPA Traceability Protocol for the Assay and Certification of Gaseous Calibration Standards (see https://www.epa.gov/air-research/epa-traceability-protocol-assay-and-certification-gaseous-calibration-standards).

The EPA expects that states may choose to deploy direct-reading NO₂ analyzers at some of their Photochemical Assessment Monitoring Station (PAMS) locations. It also expects that more state and local agencies may deploy these analyzers into other exiting ambient monitoring stations. The calibration of these analyzers would be easier if accurate and stable NO₂ EPA Protocol Gases were available. Accuracy requires the availability of NIST-traceable reference standards with which to assay candidate standards. Stability requires the availability of cylinders in which NO₂ gas mixtures do not decay.

NIST-traceable NO₂ reference standards are currently available from VSL, the Dutch equivalent of NIST. An updated Declaration of Equivalency has been signed by both organizations. Additionally, NIST is in the process of developing a new suite of NO₂ primary standards and is doing stability testing on its SRM 2660 (i.e., 100 ppm NOₓ in air). NIST will attempt to dilute down to lower levels of NO₂ in cylinders.

The remaining roadblock to certifying NO₂ as an EPA Protocol Gas is establishing an understanding of its long-term stability. While VSL has shown that its NO₂ Primary Reference Materials (PRMs) in Luxfer SGS™ aluminum cylinders are reasonably stable (i.e., one year for 10 to 100 ppm), the EPA is not aware of corresponding long-term stability data for commercially-produced NO₂ gas mixtures in SGS™ or other passivated aluminum cylinders. The EPA will need such data before it can include NO₂ gas mixtures among those gas mixtures that can be certified as EPA Protocol Gases. The EPA would
like to get data from a wide variety of sources to assess the capability of the whole specialty gas industry, rather than just for isolated producers. The EPA needs and intends to treat all producers equally without favoritism. Please send such data at your earliest convenience to Solomon Ricks (ricks.solomon@epa.gov, 919-541-5242) or Bob Wright (wright.bob@epa.gov, 919-541-4502).

The EPA plans to purchase VSL reference standards and direct-reading NO2 analyzers to allow NO2 gas mixtures to be verified as part of the ambient air Protocol Gas Verification Program (PGVP, see https://www3.epa.gov/ttn/amtic/aapgvp.html).