

Update on the ESRL GMD/WMO CO Reference Scale

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The NOAA ESRL GMD carbon cycle group, in collaboration with the halocarbons group, developed a CO reference scale for measurements of tropospheric CO in the late 1980s/early 1990s. New primary standards are needed every few years because CO tends to drift in containers. The scale was revised significantly in 2000-2001 based upon four sets of primaries prepared during the 1990s. ESRL standards have been used in atmospheric and oceanic measurements and serve in the validation for remote sensing of CO from space. The scale was adopted as the WMO reference with ESRL serving as the Central Calibration Laboratory (CCL). The CCL works closely with the World Calibration Center (at Empa, Zurich Switzerland) to provide reliable standards to the earth science community. Results from a set of primary, gravimetric standards prepared in late 2006/early 2007 and evaluated on a new state-of-the-art analyzer are presented. Comparing the most recent results with the scale designated ESRL-GMD-WMO 2000 show agreement to within 1%.

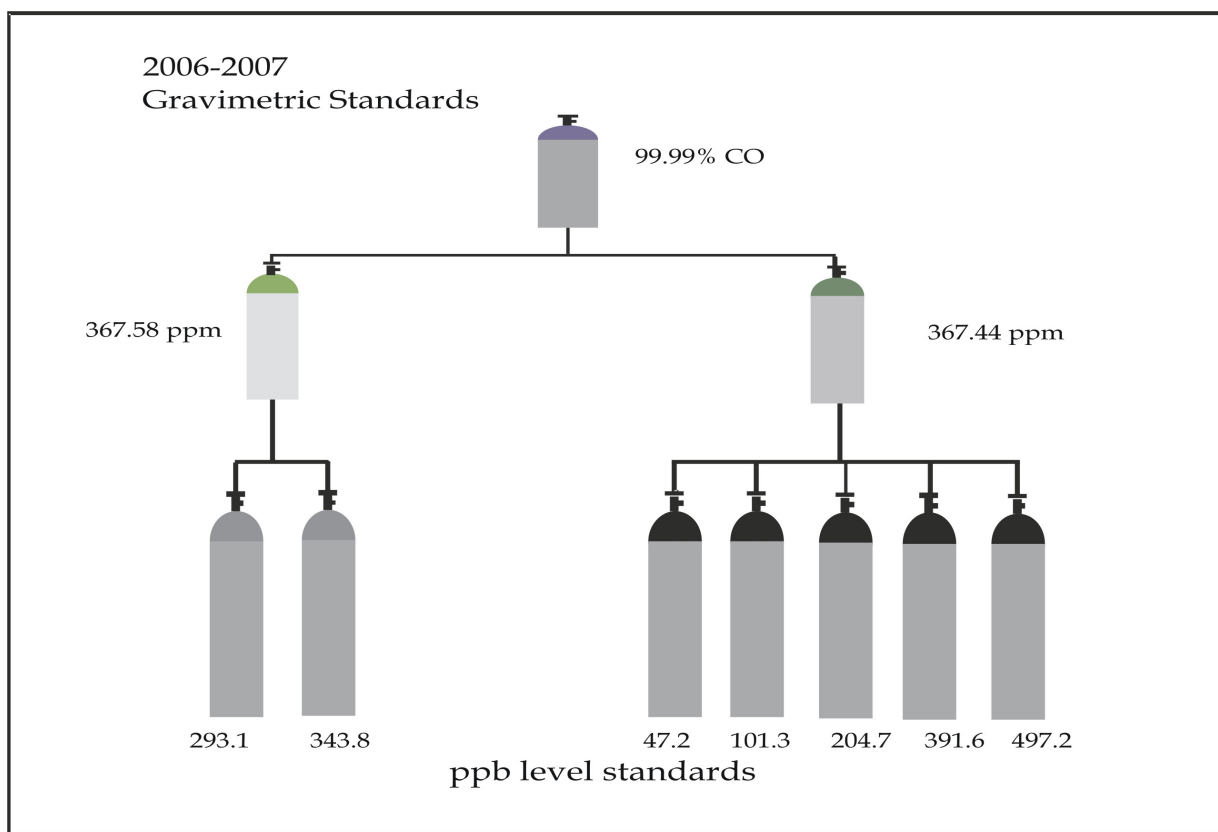


Figure 1. Preparation sequence for the 2006/2007 primary standards: Nearly pure CO was diluted gravimetrically to two ppm level daughters, these then served as parents for atmospheric level (ppb) standards.