Summary of hydrogen peroxide measurements:

This data set contains the hydrogen peroxide measurements made from the NCAR C-130 on the ACE-1 program. Four data parameters are available:

PERACAL: This is the total soluble peroxide concentration measured as hydrogen peroxide. This is the atmospheric hydrogen peroxide plus some fraction of the soluble organic hydroperoxides.

H2O2: This is the concentration of gas-phase hydrogen peroxide in ppbv.

ROOH: This is the concentration of soluble organic hydroperoxides measured as hydrogen peroxide. The concentration of H2O2 + ROOH is equal to PERACAL.

MHPEQ: This is the equivalent concentration of methylhydroperoxide assuming that all of the ROOH is methylhydroperoxide. The MHPEQ takes the ROOH and applies the Henry's law constant to generate the equivalent atmospheric concentration of methylhydroperoxide.

Hydrogen peroxide measurements were made using the dual-enzyme analytical technique where catalase enzyme is used to discriminate between hydrogen peroxide and the organic hydroperoxides. Quantitative analysis of the hydroperoxides is accomplished by reaction with p-hydroyphenyacetic acid and horseradish peroxidase; this produces a fluorescent dimer that is quantitated by fluorescence spectroscopy. The instrument utilized a single collection coil for the atmospheric hydroperoxides and the resulting hydroperoxide solution was then split between the analytical channels. The pH of the final reaction mixture was raised by a concentrated ammonium hydroxide added through a Nafion membrane. The instrument was calibrated before each flight with aqueous standards. The instrument was zeroed every hour for five minutes. All zero and calibration data have been removed from the data set and replaced with -32768. The data has been shifted 4 minutes at 1000 mbar and about 5 minutes at 400 mbar to remove the sampling lag.

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