Errata for “WMO WDCGG DATA SUMMARY WDCGG No.44”

18 March 2021

“APPENDIX A ANALYSIS” (p. 36)

Correct
(currently available version)

APPENDIX A ANALYSIS

This appendix summarizes the method used to calculate global mean mole fractions and related quantities of CO_2, CH_4, N_2O and CO as described by WMO (2009).

The analysis is applied to monthly mean mole fraction data reported to WDCGG by fixed stations and ships with fixed observation points. Where no monthly data are reported, values are calculated from daily or hourly valid data based on a simple arithmetic mean with the consent of data contributors. Data from mobile platforms such as ships without fixed observation points and aircraft are not used in this analysis, but are considered in other applications. Where data are reported for several different altitudes, those for the highest level are used due to their expected larger footprint.

For halocarbons, monthly mean mole fractions from observation at individual stations are presented. Scale differences have not been taken into account in this analysis.

The mole fraction is defined as the number of molecules of a target gas species divided by the number of all molecules of dry air. Values are expressed as parts per million (ppm), parts per billion (ppb) or parts per trillion (ppt), corresponding to the SI units of μmol/mol, nmol/mol and pmol/mol, respectively.

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For halocarbons, only monthly mean mole fractions from observation at individual stations are presented. Global averaging is not performed due to the scarcity of reporting sites.

The mole fraction is defined as the number of molecules of a target gas species divided by the number of all molecules of dry air. Values are expressed as parts per million (ppm), parts per billion (ppb) or parts per trillion (ppt), corresponding to the SI units of μmol/mol, nmol/mol and pmol/mol, respectively.

"APPENDIX B CALIBRATION AND STANDARD SCALES 3. Methane (CH_4)" (p. 44)

Correct
(currently available version)

APPENDIX B CALIBRATION AND STANDARD SCALES

3. Methane (CH_4)

The GAW Programme has a CCL for CH_4 at NOAA/ESRL (Dlugokencky *et al.*, 2005; WMO, 2017). Two WCCs for CH_4 are also run by the Swiss Federal Laboratory for Materials Testing and Research (Empa; Dübendorf, Switzerland) and the Japan Meteorological Agency (JMA; Tokyo, Japan) (WMO, 2017).

The current WMO Mole Fraction Scale is X2004A, which consists of 16 existing standards covering the range of the previous WMO X2004 scale and 6 new standards to expand the range of the scale. Table B4 summarizes the CH_4 standard scales used by stations contributing to the WDCGG and lists provisional multiplying conversion factors applied for analysis in the Data Summary. In this issue, the factor for conversion between the X2004A and X2004 scales is taken as 1 because the difference between them is minor.

Mole fractions on the WMO X2004 scale are 1.0124 times higher than those on the NOAA 1983 scale (Dlugokencky *et al.*, 2005). Values on the NOAA 1983 scale are up to around 1.5% lower than those of the Tohoku University gravimetric scale (Aoki *et al.*, 1992; Dlugokencky *et al.*, 1994) and 1.0151 times lower than those on the scale of the Atmospheric Environment Service (AES, now known as Environment and Climate Change Canada (ECCC)) (Worthy *et al.*, 1998). The conversion factor 1.0124 / 1.0151 = 0.9973 is adopted for comparison of the ECCC scale with the WMO X2004 scale. The Tohoku University scale can be converted to the WMO X2004A scale by multiplying by 1.0001 (Prinn *et al.*, 2018).

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