

Interactive comment on “Tropospheric observations of CFC-114 and CFC-114a with a focus on long-term trends and emissions” by Johannes C. Laube et al.

Anonymous Referee #1

Received and published: 1 September 2016

General Comments:

This manuscript discusses the determination of isomers CFC-114 and CFC-114a in the atmosphere. The isomers have routinely been reported as a sum of the isomers in the past with the assumption that CFC-114a abundance is $\sim 10\%$ that of CFC-114. This manuscript describes how the isomers are separated and how analysis of a variety of atmospheric samples indicates that in fact the source and trends of each isomer have varied over time.

The manuscript provides useful information that is currently missing from many ozone assessment reports.

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The presentation of the manuscript and quality of Figures/Tables is appropriate for ACP

Specific Comments:

P1 L22 The global ban came into force in 2010 but non-A5 countries in 1996.

P1 L36 increased from 4.2% to 6.5%

P1 L37 36 year period

P3 L30 Chan et al., 2006 not 2007

P4 L6 missing a closing bracket) to close (clean marine ...)

P5 L5 Can you provide the details of the column supplier, diameters, length and film thickness.

P4 L16 Fraser at al., 1986 is not listed in the references?

P5 Calibration – what calibration scale are CFC-114 and CFC-114a reported on?

P5 L18 Is it reasonable that the average sample precision is 1.1% for both isomers considering one isomer is 14-22x more abundant than the other, and the mole fraction of the samples has increased from 7.9 to 14.8 (CFC-114) and 0.35 to 1.03 (CFC-114a) over time.

P5 L26 What is the quoted uncertainty associated with the DuPont sample?

P5 L31 Use of Epoxy resins cover a wide range of potential chemicals and by-products - are the authors sure that no contamination has been introduced to the calibration drums?

P7 L8 On what evidence is the assumption about latitudinal distribution of CFC-114/114a made?

P7 L17 There appears to be some missing text? "based on work by and".

P7 L29-32. The quoted uncertainties appear quite small especially 5% for modelling

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uncertainties. Can the author describe more fully how uncertainties have been derived?

P14 L30 need full author list not just et al.:

Figure 1. The way the two y-axes are plotted makes the CFC-114 and CFC-114a trends appear to converge between 1980-1990. Can the scales be adjusted to allow the trends and uncertainties to be viewed more easily?

Figure 2. How can you be sure that the rapid change in ratio of CFC-114a/CFC-114 is not driven by emissions from Asia/Taiwan as detailed in Figure 6?

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-610, 2016.

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