

Interactive comment on “Global Warming Potentials for the C₁-C₃ Hydrochlorofluorocarbons (HCFCs) Included in the Kigali Amendment to the Montreal Protocol” by Dimitrios K. Papanastasiou et al.

Anonymous Referee #2

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This paper describes the derivation of atmospheric lifetimes, ozone depletion potentials, infrared spectra, radiative efficiencies and global warming and temperature potentials for a very comprehensive set of HCFCs. The work is largely based on theoretical approaches but has a strong focus on comparisons with observation- and lab-based data. The paper is generally of sufficient quality and novelty for publication in ACP. I do however have two main concerns: Firstly, previous literature on theoretical calculations of GWPs, ODPs, etc. is largely ignored. Including more references at least for the most important HCFCs would also help the authors to highlight why their approach is

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superior to previously published works. Secondly, the authors calculate ODPs partly based on outdated values as is described in one of the specific comments below.

Title: I think the current title describes the content of the paper insufficiently.

Figure S1: HFC-227ea is misspelled and HCFC-22 and HFC-125 appear twice.

Page 5, line 15-16: This is misleading as only one HCFC seems to have been used.

Page 5, line 16-17 and line 19: What does 'in most cases' mean? 51 %?

Page 6, line 14-15: The method previously used for calculating fractional release has recently been proved wrong and age-of-air estimates have been improved, both of which have substantial implications for a number of compounds including HCFCs. I am surprised that the editor did not question this as he is an author on all three recent papers (Ostermoeller et al., 2017; Engel et al., 2017; Elvidge et al., accepted, 2018 – all ACP).

Figure 3: It would help to see the experimental and the calculated spectrum in the same plot.

Page 11, line 29-31: I don't think there should be a section for GTPs if it only contains one sentence.

Page 17, line 3-4: Why are these HCFCs of primary interest?

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