The authors have provided two important components for the use of eight halogenated compounds as tracers of ocean circulation. They have reconstructed the atmospheric source functions and estimated their solubilities in water and seawater. These two items should enable reconstructions of the surface seawater concentrations of these compounds as a function of time. However the utility of these compounds as transient tracers depends more strongly on whether they are conservative in seawater, and whether they can be precisely and accurately measured on relatively small volumes of seawater in a timely fashion. A cautionary tale can be found in the use of CFC-113 as a tracer in the ocean. A great deal of time and effort went into developing the analytical method and determining its solubility. However CFC-113 exhibits non-conservative behavior in seawater. This paper needs to be revised before publication. There are a few scientific issues to be addressed and numerous grammatical corrections.

Scientific Issues:
Why not direct the reader to the AGAGE website (https://agage.mit.edu/data/agage-data) for the recent atmospheric measurements? Why were these eight compounds chosen out of the many compounds measured by AGAGE?

The authors provide late winter atmospheric concentrations for these compounds. Are these values much different then a linear interpolation between the mid-year values? Is there a systematic offset that makes it important to include the NH Feb and SH Aug concentrations?

Most of the use of transient tracers is to study the ventilation of waters colder than 10 C. However the measured freshwater solubilities presented in this manuscript do not constrain the solubility curves at temperatures colder than 298 K where the temperature dependence of the solubility becomes significant.

Editorial Comments:
P2,L10 – CFC concentrations are not “variables”
P2,L41 – Define MOZART
P3,L29 – Is it important that HFC-125 is the 5th most abundant HFC? It makes me wonder why the 2nd through 4th most abundant HFCs are not considered by the authors.
P4,L31 – The atmospheric growth rate can be reversed – not the concentrations
P4,L40 – intercalibrated rather than consistent?
P6,L10 – “see studies”?
P6,L18 – be more specific than America
P6,L21 – all data for HFC134a are first reported for HFC134a?
P7,L34 – “by in”
P9, EQN1 – csapsGCV not defined
P10,EQN8 – D,E,F not defined
P10,L14 – “some properties”?
P10,L25 – There is no Vc in the equations
P11, L13 – Use approximately when dropping significant figures
P11,L16 – “so as to”?
P11, L30 – Note that CGW model method does not provide a method for estimating Lo
P12, L2 – Methods do not think
P12,L18 – A better description of the ventilation process is needed (e.g. the mixed layer deepens...)
P13, L4 – Curves and symbols in the upper panels of many figures are difficult to distinguish.
P13, L14 – “stable” is not the correct word
P13, L36 – As written “they” refers to the interhemispheric gradients
P14, L13 – Bimodal has a specific meaning, choose a more appropriate word for describing this curve.
P14, L15 – ‘other one” implies a second plateau.
P14, L17 – verb missing
P14, L21 – “rapid” instead of “raid”
P14, L31 – “are” not “were”
P15, L8 – How do the authors distinguish “exponential” from “quadratic” from ‘linear”?
P15, L10 – larger instead of “large”
P15, L13 – missing verb
P15, L35 – “reduced”
P16, L12, 13 – sentence needs rewritten
P16, L22 – What does “annual growth rates exhibit a normal distribution” mean?
P17, L10 – “accelerated phase out” not correct
P17, L11 – “bank of HCFC-22 exist”?
P17, L29 – “even out” is not a noun
P18, L18 – Warner and Weiss did use a salting out coefficient as defined in Eqn 6
P18, L24 – Fitting the solubility at temperatures between 25-65 C is not an important finding
P18, L29 and L31 – What happened to the factor of 10^15?
P21, L2 – the Cl radical is the culprit, not the prime suspect
P21, L10 – Use e.g. before presenting a subset of the manuscripts that use the CFCs as ocean tracers