

Interactive comment on “Kinetic isotope effects in the gas phase reactions of OH and Cl with CH₃Cl, CD₃Cl, and ¹³CH₃Cl” by A. A. Gola et al.

Anonymous Referee #1

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Review of “Kinetic isotope effects in the gas phase reactions OH and Cl with CH₃Cl, CD₃Cl, and ¹³CH₃Cl”, by Gola et al., ACPD 2005-5-3873.

General Comments:

This paper describes an original and timely determination of the kinetic isotope effects in the reactions of OH and Cl with isotopic variants of methyl chloride, the most important source of chlorine to the atmosphere. The KIE for C-12/C-13 methyl chloride with OH is particularly useful, since this provides necessary input for current attempts to balance the methyl chloride budget on the basis of isotopic measurements. The methodology used appears solid and the data are of high quality. I recommend publi-

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cation of this paper in ACP, after consideration of the comments made below.

Specific Comments:

Introduction and conclusion, I think that the Keppler et al. paper and the latest WMO Scientific Assessment of Ozone Depletion (2002) suggest that 3/4 of the sources of methyl chloride are accounted for?

I did not see mention of any determinations of the rate of “dark” (heterogeneous) methyl chloride loss in the chamber. Given the relatively long duration of the experiments (hours), could losses of this type lead to any errors in the measured KIE’s?

Pg. 3878: Am I right that the major fate of H atoms is reaction with O₂, not with ozone, so that reaction (6) is only a minor OH source?

Pg. 3883, There are other references on KIE’s of OH,Cl with methane (e.g., Dunlop and Tully, JPC, 1993; Davidson et al., JGR, 1987). I don’t think a comprehensive list is necessary though.

Technical Corrections:

Pg, 3880, first line of results, delete the work “a”

Pg. 3882, first line of section 3.2, suggest replacing “with OH reactions” with “on the reaction of OH”.

Pg. 3883, line 2, replace “analogue” with “analogous”.

Pg. 3883, The sentence beginning with “Especially the high” is awkward.

Subscripts and superscripts did not show up in the reference list.

Caption of Figure 4, should be 2143 cm⁻¹?

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 3873, 2005.

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