

## ***Interactive comment on “Kinetic isotope effects in the gas phase reactions of OH and Cl with CH<sub>3</sub>Cl, CD<sub>3</sub>Cl, and <sup>13</sup>CH<sub>3</sub>Cl” by A. A. Gola et al.***

**A. A. Gola et al.**

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The referee points to the latest WMO Scientific Assessment of Ozone Depletion (2002) and to the accompanying paper by Keppler et al. both in which it is suggested that 3/4 of the sources of methyl chloride are accounted for. This is correct and we will change the text accordingly in the introduction on page 3874, lines 21-22, and include a new reference to Montzka and Fraser, WMO, 2003.

The referee raises a valid point on the influence of “dark” (heterogeneous) methyl chloride loss in the chamber. We have actually measured the lifetime of methyl chloride in the cell. The lifetime methyl chloride in purified air in the reactor is around 96 days, corresponding to a “dark” loss rate coefficient of  $1.2 \times 10^{-7} \text{ s}^{-1}$ . For the two reaction mixtures (20 ppm Cl<sub>2</sub> respectively 2000 ppm H<sub>2</sub> and 200 ppm O<sub>3</sub> in 1013 hPa purified

air) the lifetime of methyl chloride was determined to be 31 respective 21 days. With these “dark” loss rate coefficients, the systematic errors are less than the statistical error of the least squares analyses. We will include this information at the end of the section 2.2, and in section 2.3.

The referee is correct; the major fate of H atoms is reaction with O<sub>2</sub>, not with ozone, so that reaction (6, p 3878) is a minor direct OH source. However, the by far dominating reaction of the HO<sub>2</sub> radicals formed by H + O<sub>2</sub> is with O<sub>3</sub> to give HO + O<sub>2</sub> + O<sub>2</sub>. We suggest leaving the reaction scheme as it is.

The referee points out that there are other references on KIE’s of OH and Cl with methane than the ones given on p. 3883 (e.g., Dunlop and Tully, JPC, 1993; Davidson et al., JGR, 1987), but states at the same time that a comprehensive list is not necessary. We apologize for unintentionally having left out relevant citations and suggest including additional 7 references (Dunlop and Tully, JPC, 1993; Davidson et al., JGR, 1987; DeMore, JPC, 1993; Gordon and Mulac, IJCK, 1993; Matsumi et al., JPC, 1996; Clyne et al., JCS, 1973; Chiltz et al., JCP, 1963) in the final version of the manuscript.

We agree to the linguistic/technical suggestions/corrections and will modify the final version of the manuscript accordingly.

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

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