Supplemental Information

The very short-lived ozone depleting substance $CHBr_3$ (bromoform): Revised UV absorption spectrum, atmospheric lifetime and ozone depletion potential

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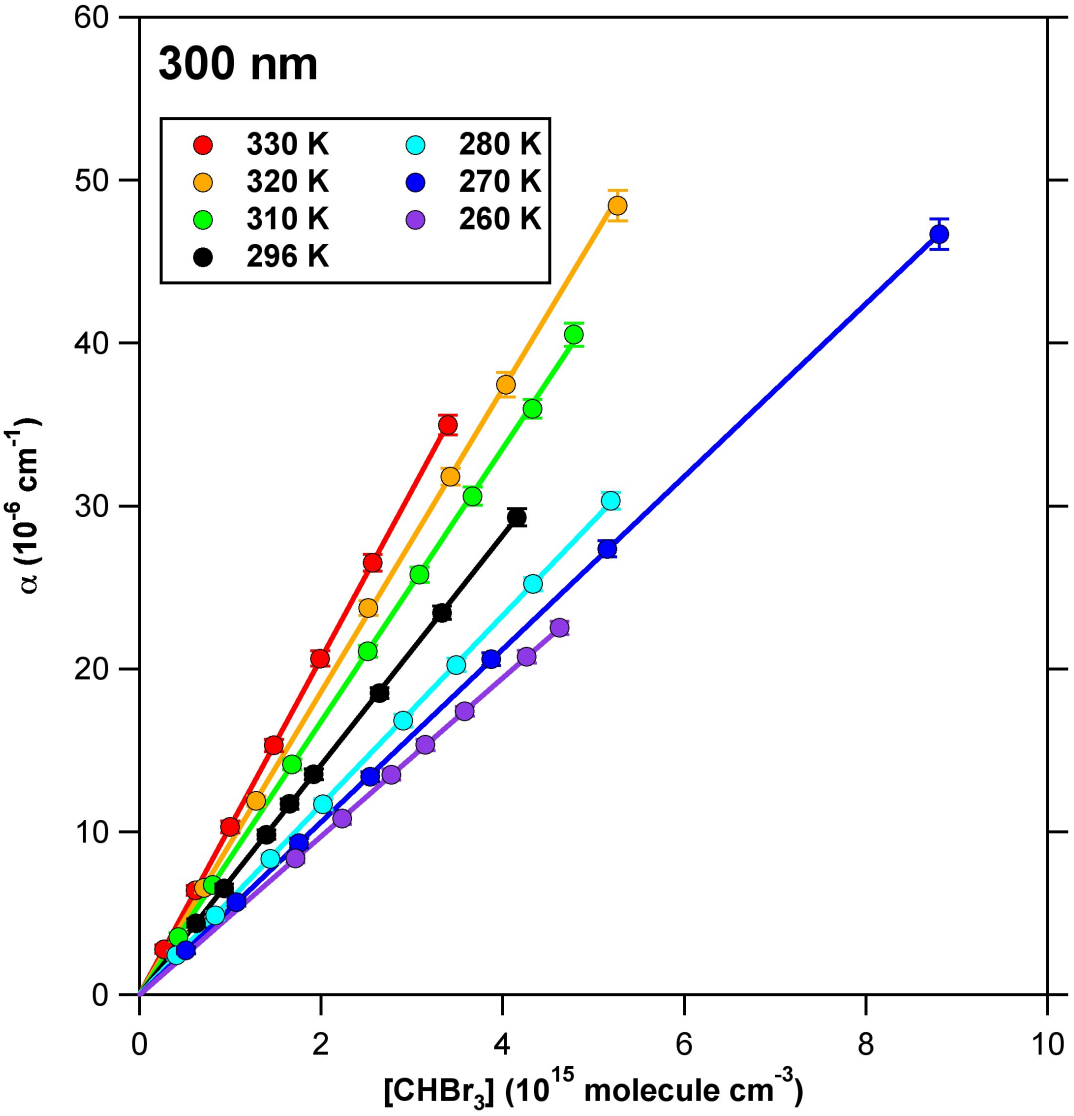

Figure S1. Beer's law plot for the extinction of $CHBr_3$ at 300 nm at the temperatures given in the legend. The experimental data has been corrected for Rayleigh scattering as described in the text. The error bars are 1σ values from the precision of the cavity ring-down extinction measurement. The lines are a weighted linear least-squares fits of the data where the slope is equal to the $CHBr_3$ absorption cross section at 300 nm (see text for values).

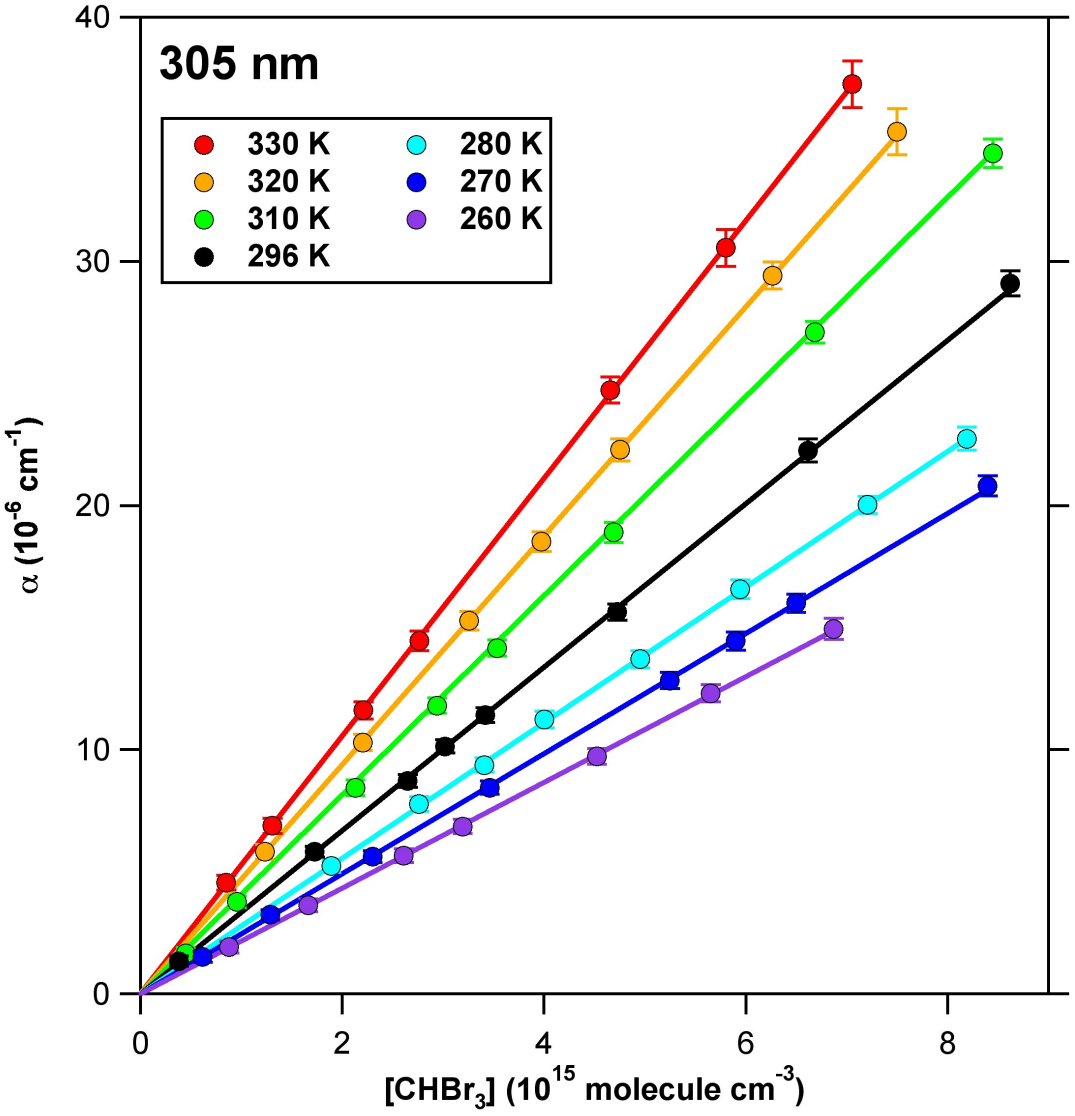

Figure S2. Beer's law plot for the extinction of $CHBr_3$ at 305 nm at the temperatures given in the legend. The experimental data has been corrected for Rayleigh scattering as described in the text. The error bars are 1σ values from the precision of the cavity ring-down extinction measurement. The lines are a weighted linear least-squares fits of the data where the slope is equal to the $CHBr_3$ absorption cross section at 305 nm (see text for values).

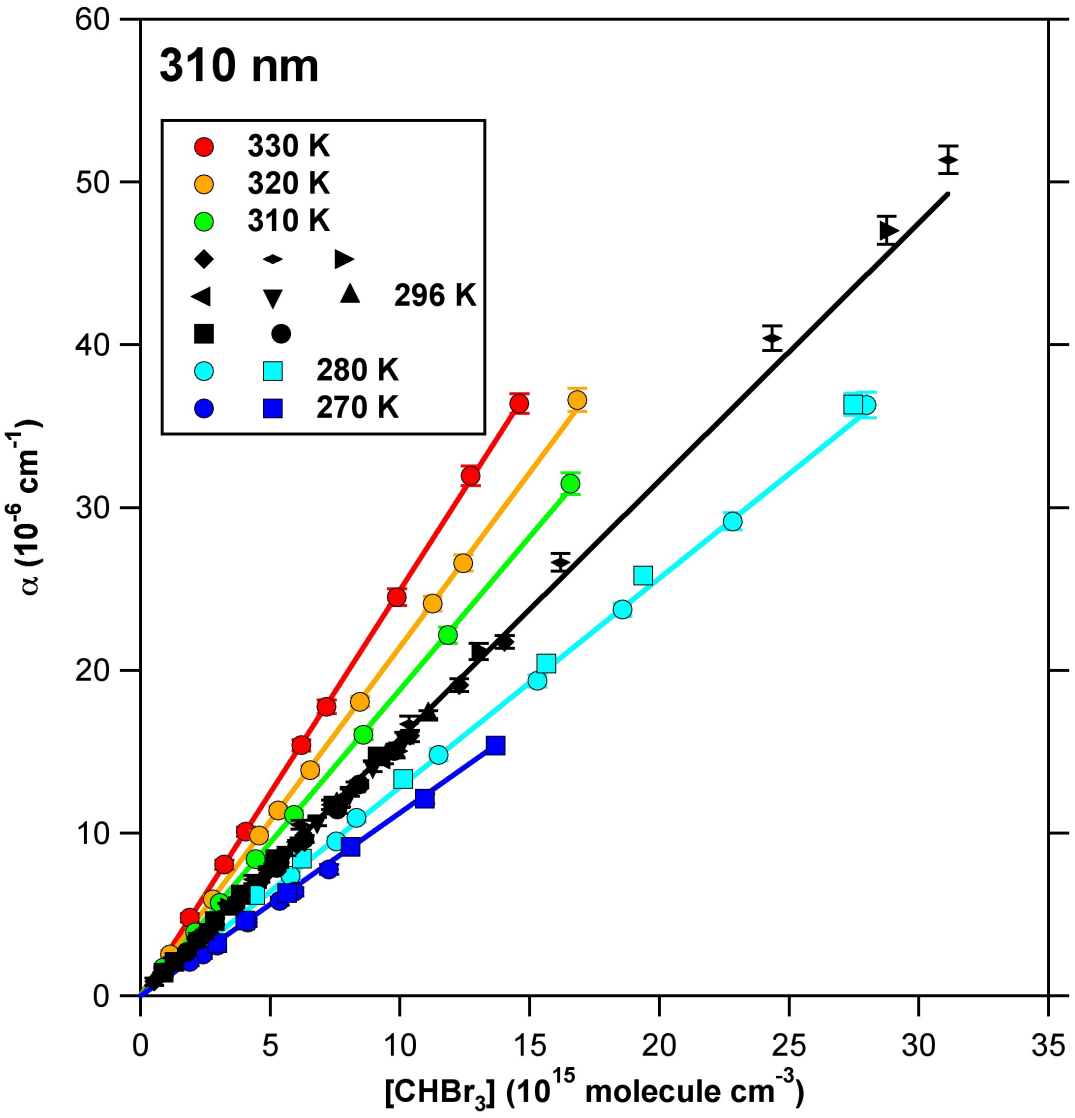

Figure S3. Beer's law plot for the extinction of $CHBr_3$ at 310 nm at the temperatures given in the legend. The different symbols are results from independent experiments including variations in experimental conditions as described in the text. The experimental data has been corrected for Rayleigh scattering as described in the text. The error bars are 1σ values from the precision of the cavity ring-down extinction measurement. The lines are a weighted linear least-squares fits of the data where the slope is equal to the $CHBr_3$ absorption cross section at 310 nm (see text for values).

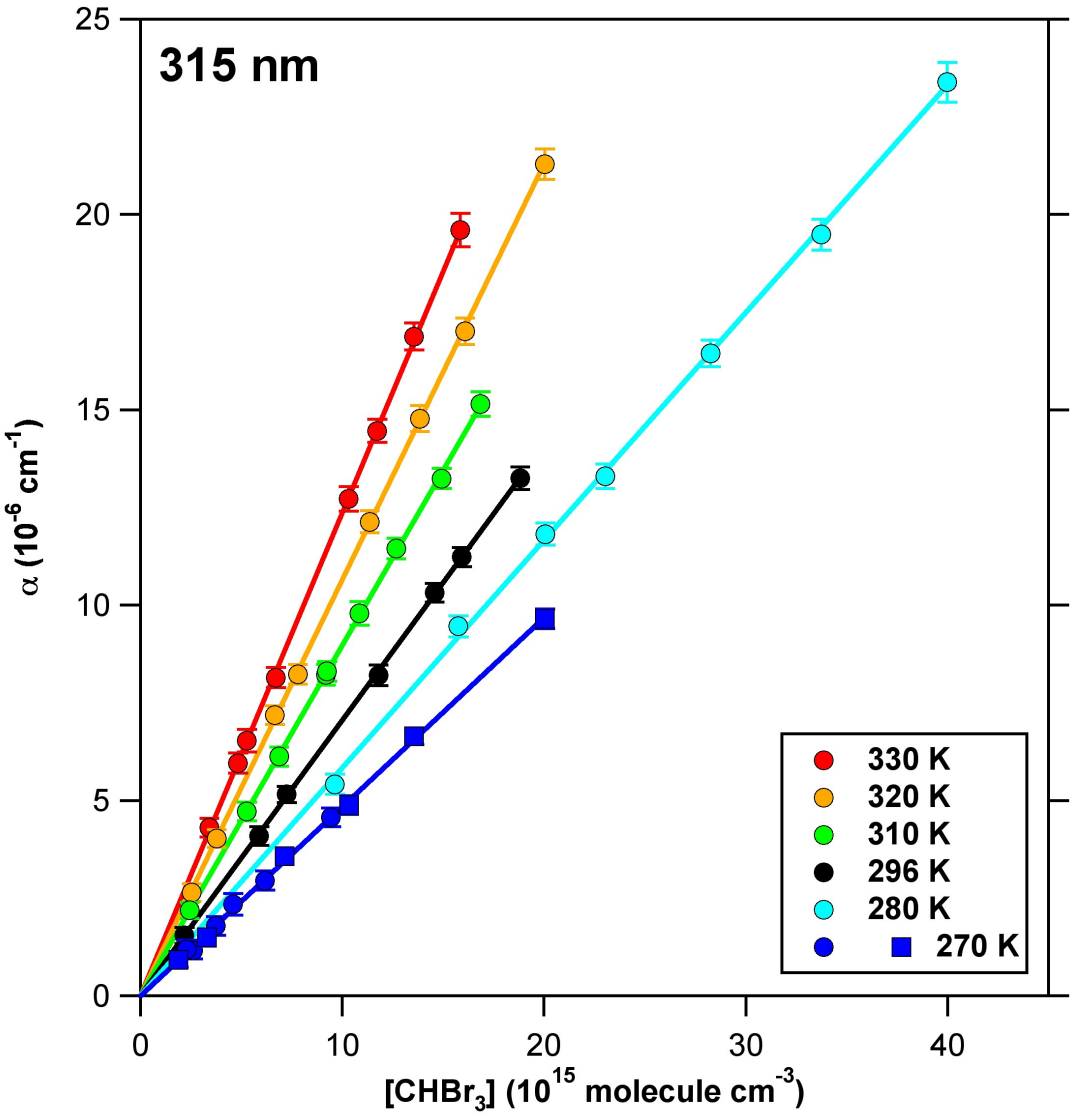

Figure S4. Beer's law plot for the extinction of $CHBr_3$ at 315 nm at the temperatures given in the legend. The different symbols are results from independent experiments including variations in experimental conditions as described in the text. The experimental data has been corrected for Rayleigh scattering as described in the text. The error bars are 1σ values from the precision of the cavity ring-down extinction measurement. The lines are a weighted linear least-squares fits of the data where the slope is equal to the $CHBr_3$ absorption cross section at 315 nm (see text for values).

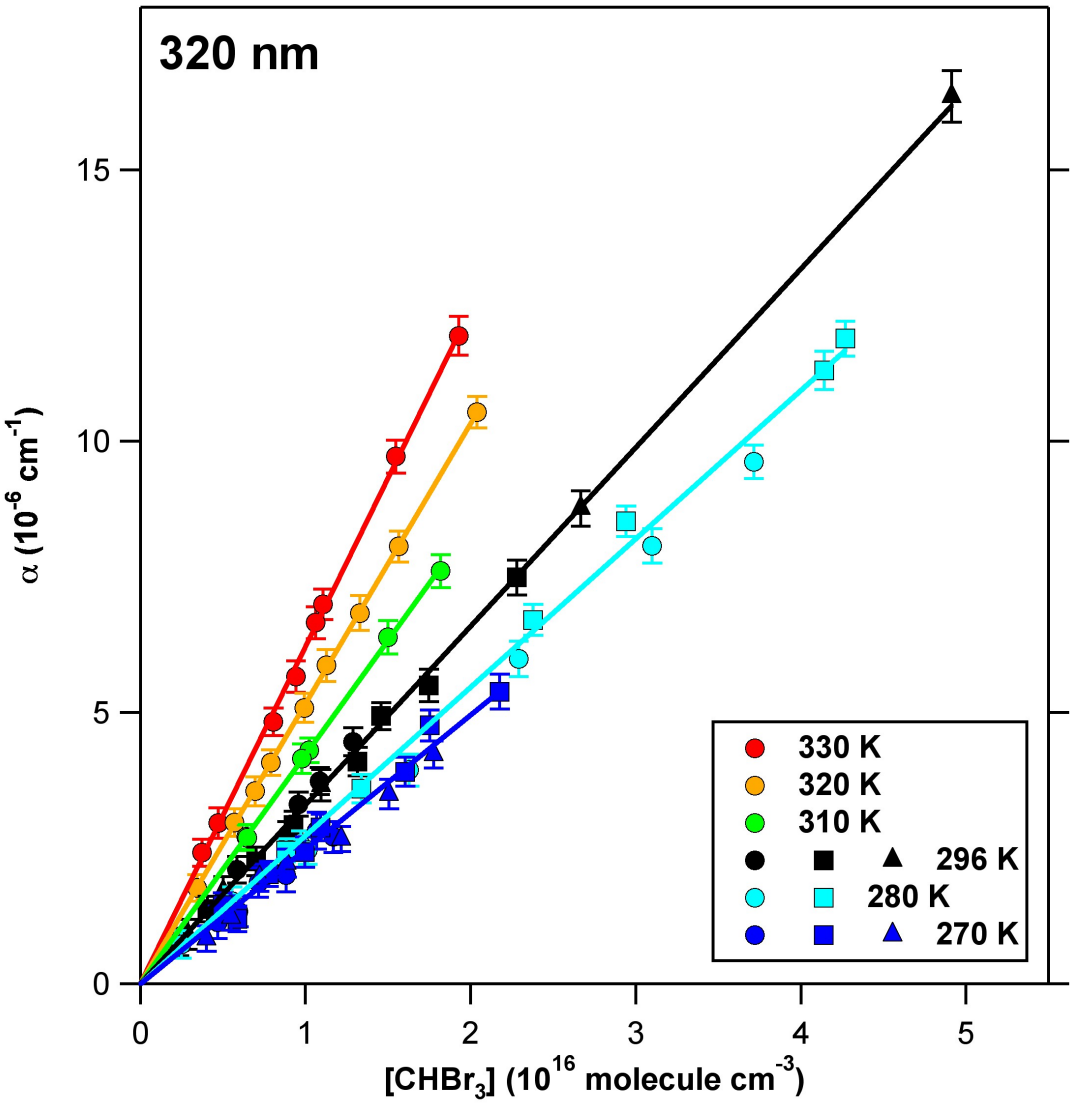

Figure S5. Beer's law plot for the extinction of $CHBr_3$ at 320 nm at the temperatures given in the legend. The different symbols are results from independent experiments including variations in experimental conditions as described in the text. The experimental data has been corrected for Rayleigh scattering as described in the text. The error bars are 1σ values from the precision of the cavity ring-down extinction measurement. The lines are a weighted linear least-squares fits of the data where the slope is equal to the $CHBr_3$ absorption cross section at 320 nm (see text for values).

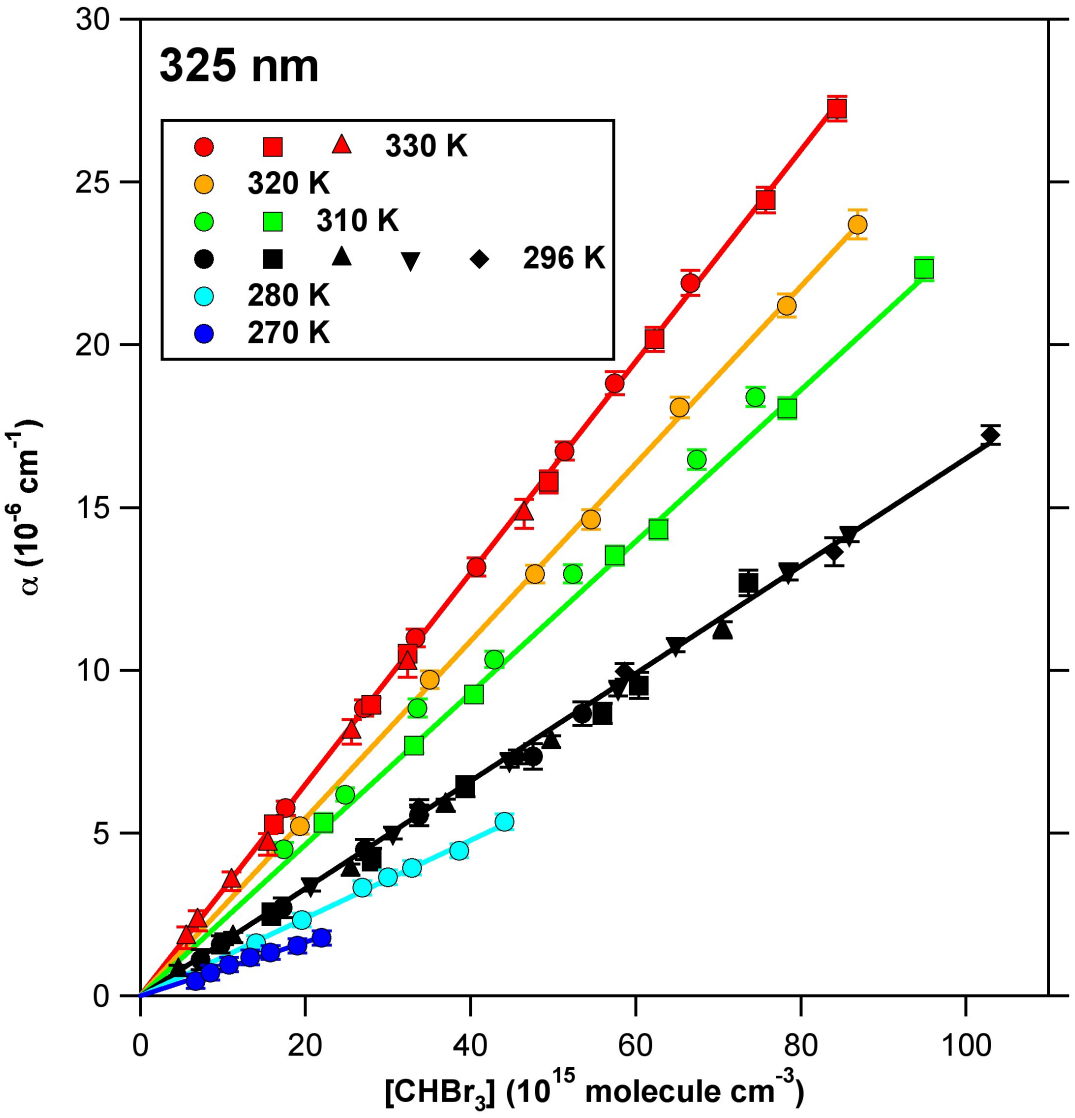

Figure S6. Beer's law plot for the extinction of $CHBr_3$ at 325 nm at the temperatures given in the legend. The different symbols are results from independent experiments including variations in experimental conditions as described in the text. The experimental data has been corrected for Rayleigh scattering as described in the text. The error bars are 1σ values from the precision of the cavity ring-down extinction measurement. The lines are a weighted linear least-squares fits of the data where the slope is equal to the $CHBr_3$ absorption cross section at 325 nm (see text for values).

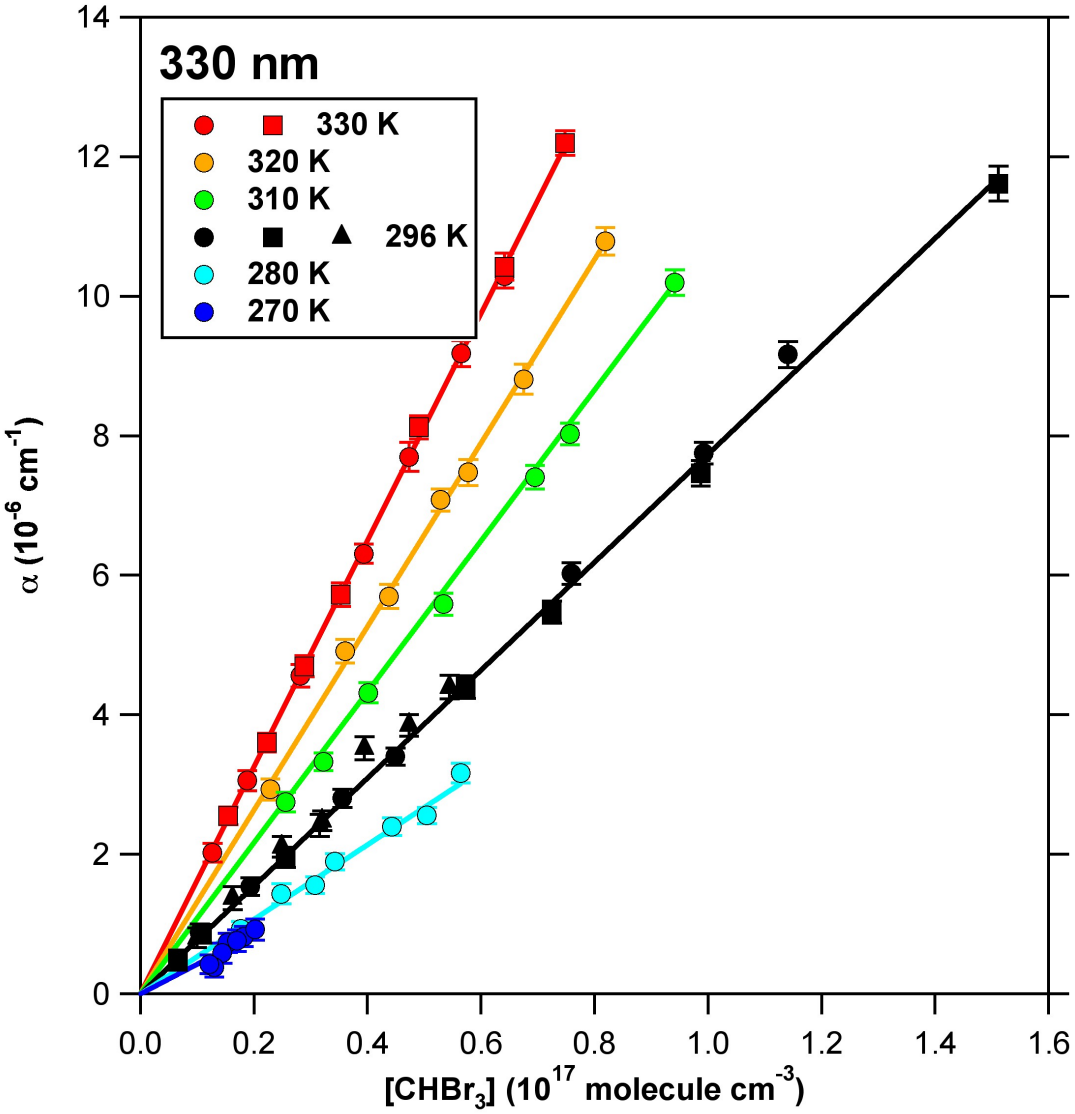

Figure S7. Beer's law plot for the extinction of $CHBr_3$ at 330 nm at the temperatures given in the legend. The different symbols are results from independent experiments including variations in experimental conditions as described in the text. The experimental data has been corrected for Rayleigh scattering as described in the text. The error bars are 1σ values from the precision of the cavity ring-down extinction measurement. The lines are a weighted linear least-squares fits of the data where the slope is equal to the $CHBr_3$ absorption cross section at 330 nm (see text for values).

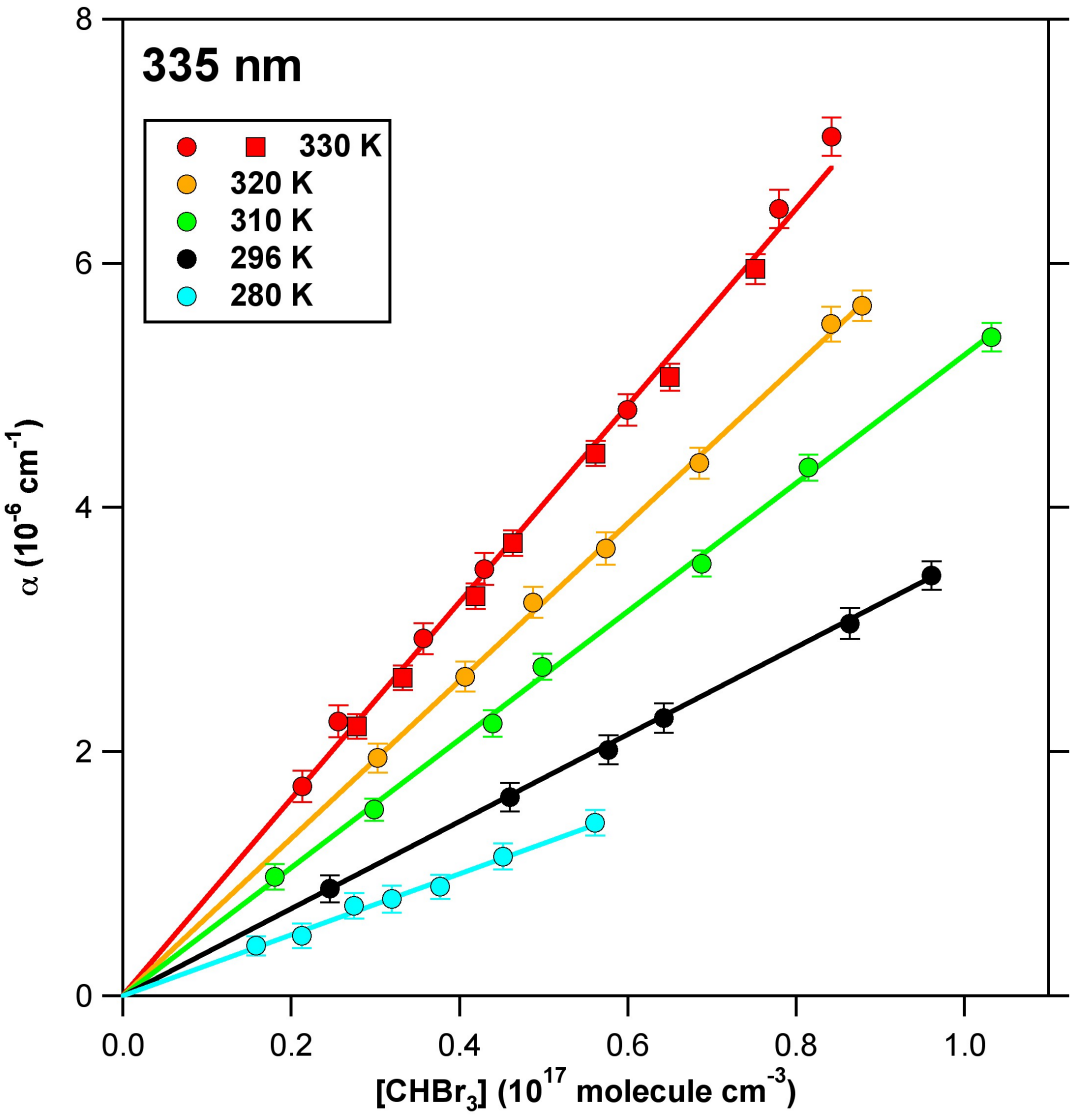

Figure S8. Beer's law plot for the extinction of $CHBr_3$ at 335 nm at the temperatures given in the legend. The different symbols are results from independent experiments including variations in experimental conditions as described in the text. The experimental data has been corrected for Rayleigh scattering as described in the text. The error bars are 1σ values from the precision of the cavity ring-down extinction measurement. The lines are a weighted linear least-squares fits of the data where the slope is equal to the $CHBr_3$ absorption cross section at 335 nm (see text for values).

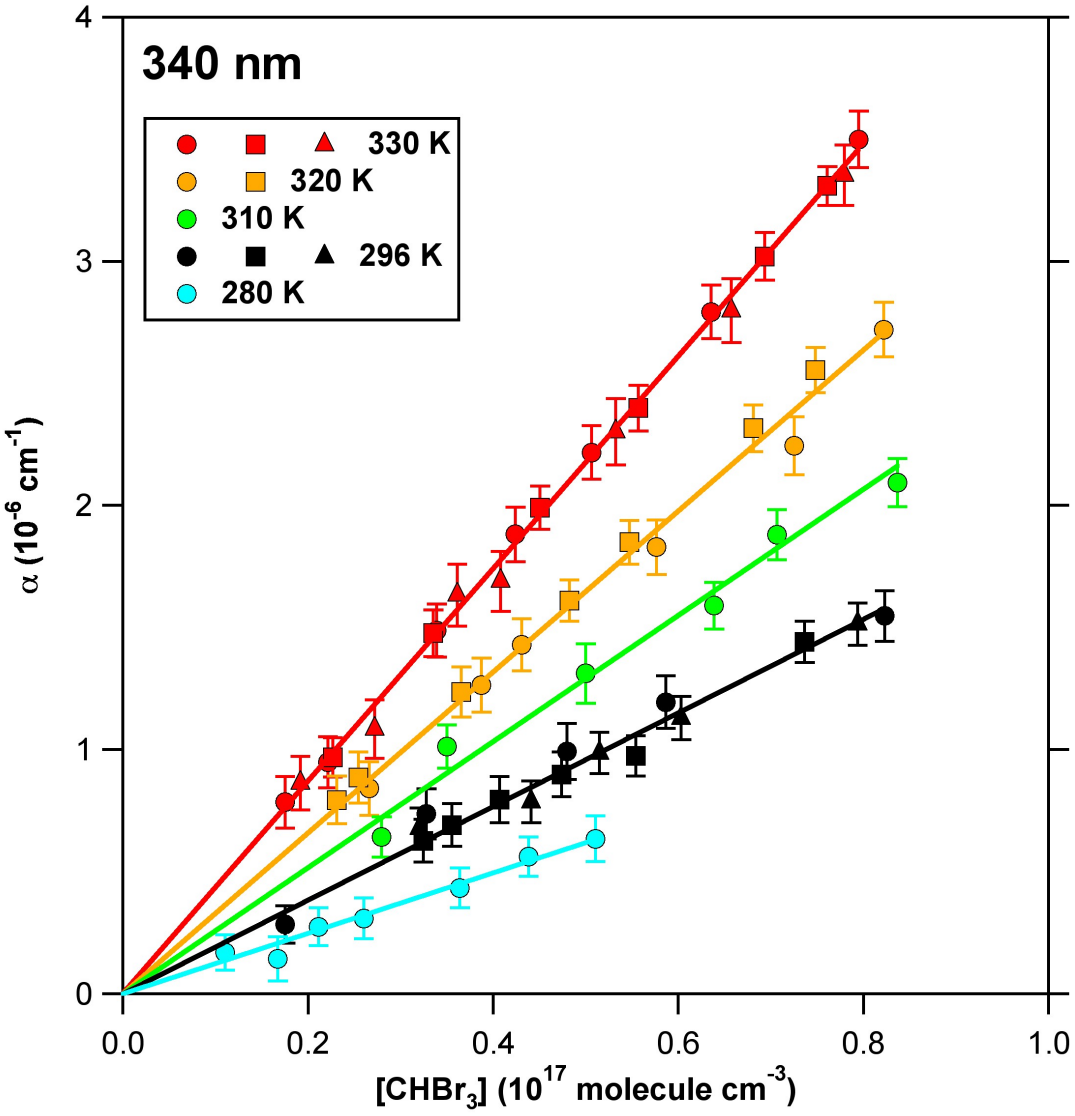

Figure S10. Beer's law plot for the extinction of $CHBr_3$ at 340 nm at the temperatures given in the legend. The different symbols are results from independent experiments including variations in experimental conditions as described in the text. The experimental data has been corrected for Rayleigh scattering as described in the text. The error bars are 1σ values from the precision of the cavity ring-down extinction measurement. The lines are a weighted linear least-squares fits of the data where the slope is equal to the $CHBr_3$ absorption cross section at 340 nm (see text for values).

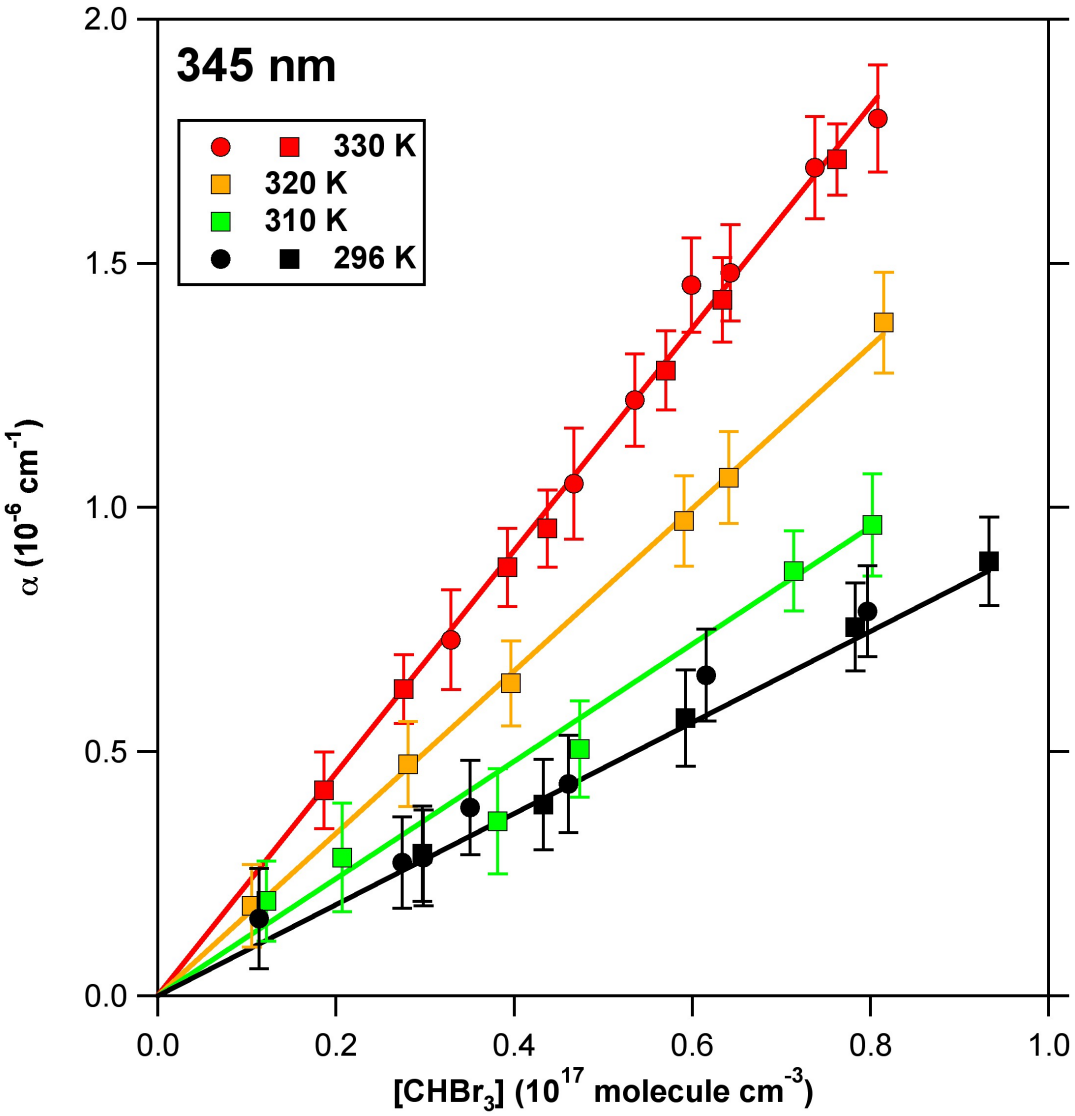

Figure S11. Beer's law plot for the extinction of $CHBr_3$ at 345 nm at the temperatures given in the legend. The different symbols are results from independent experiments including variations in experimental conditions as described in the text. The experimental data has been corrected for Rayleigh scattering as described in the text. The error bars are 1σ values from the precision of the cavity ring-down extinction measurement. The lines are a weighted linear least-squares fits of the data where the slope is equal to the $CHBr_3$ absorption cross section at 345 nm (see text for values).

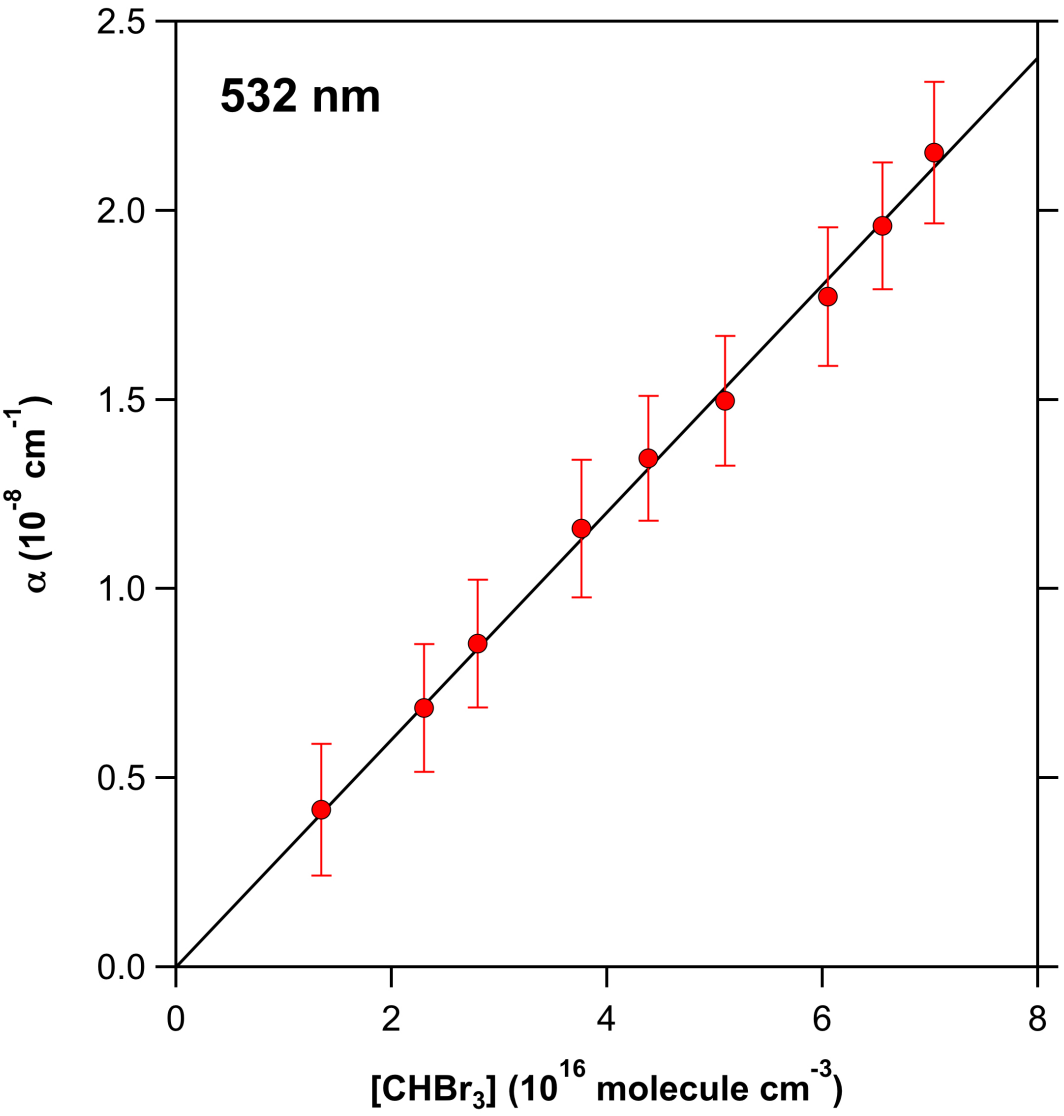

Figure S12. Beer's law plot for the extinction of $CHBr_3$ at 532 nm at 296 K.

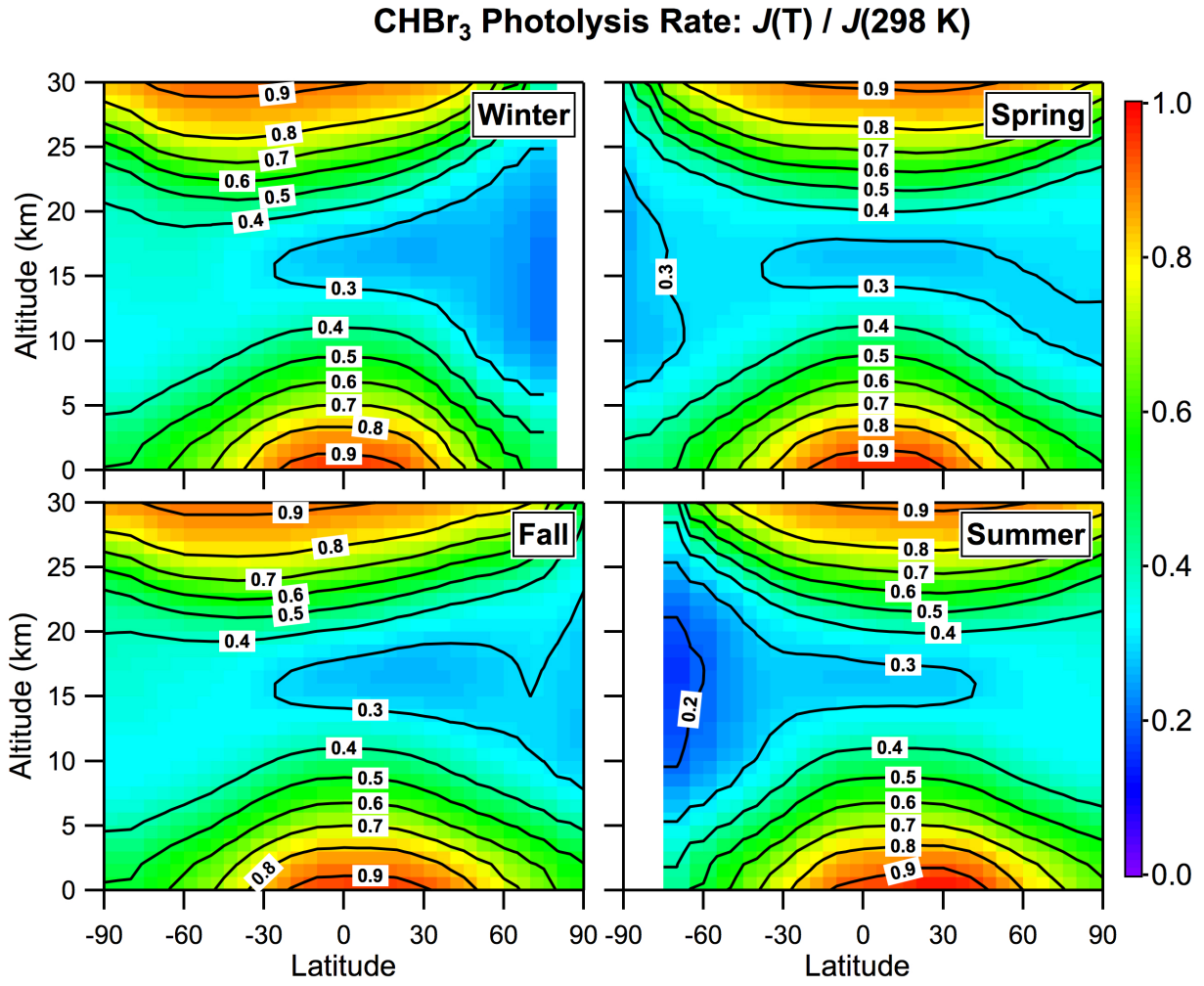

Figure S13: The impact of the $CHBr_3$ UV absorption spectrum temperature dependence on the seasonally averaged calculated photolysis rate, *J*. Photolysis rates were calculated using the $CHBr_3$ spectrum parameterization given in this work (see text for details).

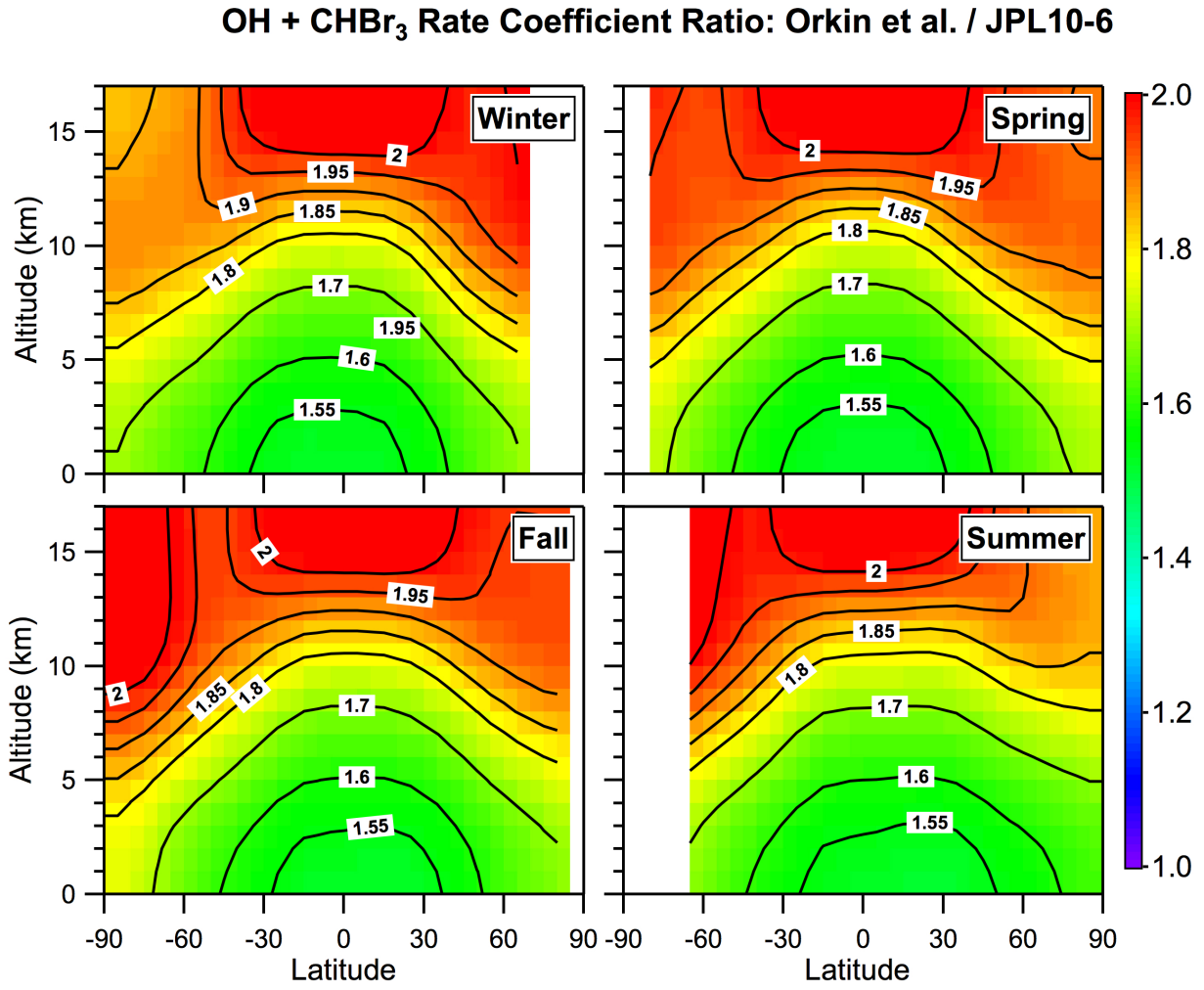

Figure S14: Ratio of the seasonally averaged $CHBr_3$ loss due to the OH radical reaction using the reaction rate coefficient results from Orkin et al. (2013) and those from the NASA/JPL 2010 recommendation. See text for description of the temperature and OH radical climatology used in the calculation.

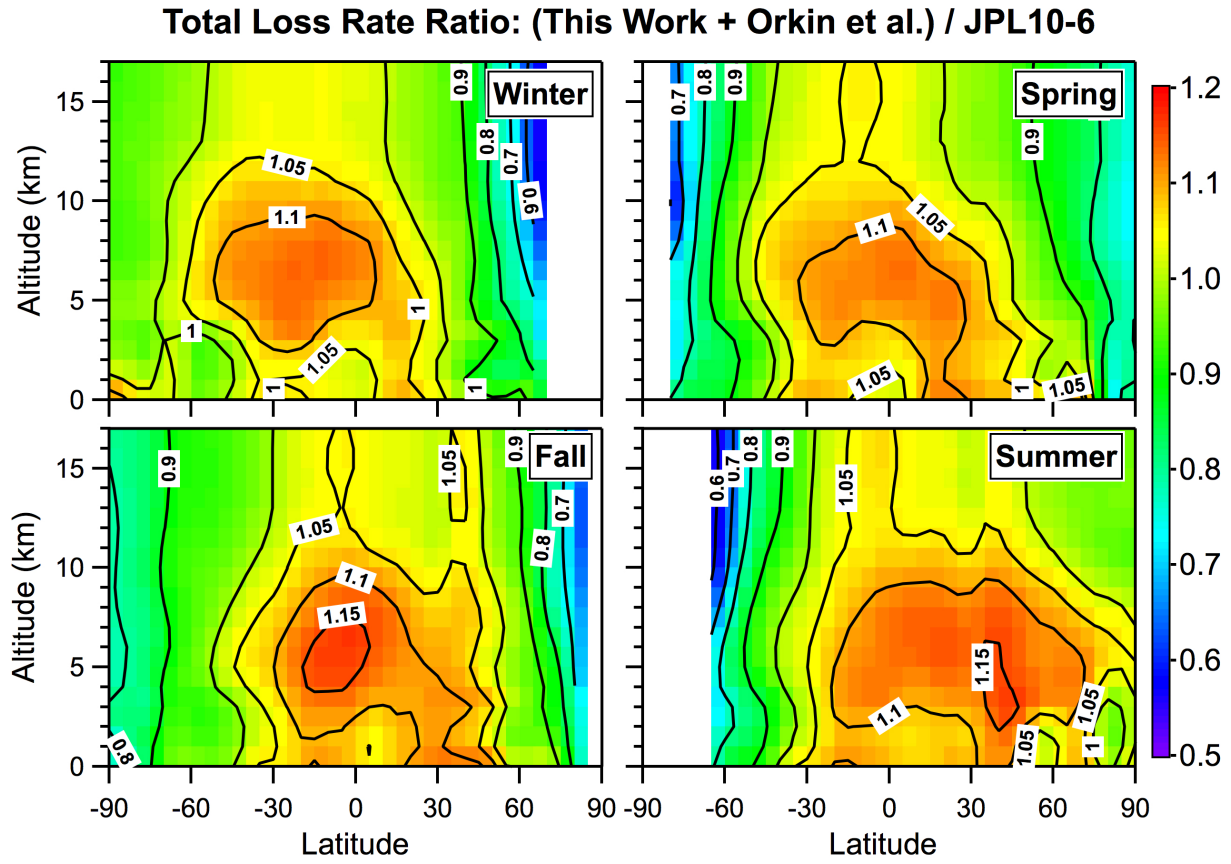

Figure S14: Ratio of the seasonally averaged $CHBr_3$ total loss due to photolysis and the OH radical reaction using the $CHBr_3$ UV spectrum from this work combined with the reaction rate coefficient results from Orkin et al. (2013) vs total loss using data from the NASA/JPL 2010 recommendation. See text for description of the climatologies used in the calculation.

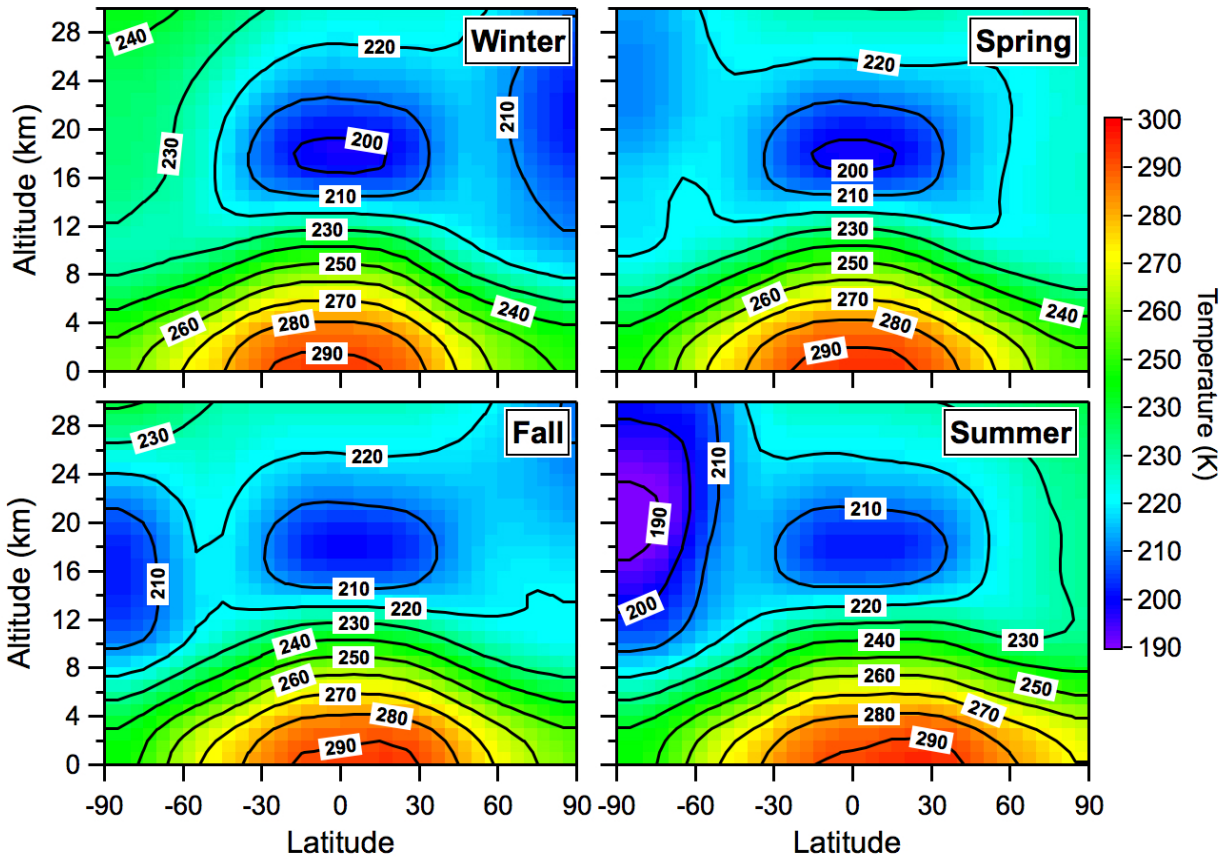

Figure S15: Temperature climatology used in the loss rate calculations, see text for further details.