



Photolysis of ozone: mass-dependent or mass-independent?

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The isotopic composition of atmospheric ozone is known to follow mass-independent fractionation curve. The enhancement of $^{18}\text{O}/^{16}\text{O}$ in stratospheric O_3 can be as high as 70 to 120‰ relative to oxygen. The fractionation is mainly affected by two processes: formation and photolysis. The former is known to possess mass-independent effect, with $^{17}\text{O}/^{16}\text{O}$ and $^{18}\text{O}/^{16}\text{O}$ variations following the slope of unity. Photolysis, however, is not known. The photolysis of gaseous molecules at feature-poor transitions is usually assumed to follow the mass-dependent fractionation but this assumption is not verified. Irradiation experiments for ozone at various wavelengths in the Hartley and Chappuis bands are carried out. Detail box modeling to interpret the results is performed. Preliminary results show that the degree of isotope fractionation deviates significantly from model predictions. Detailed results and implications will be presented.