OBSERVATION AND ANALYSIS OF THE ν_3 and $2\nu_3$ BANDS OF $^{32}S^{18}O_3$ AND $^{34}S^{18}O_3$

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We are engaged in a comprehensive investigation of the fundamental and low lying combination and overtone bands of the parent and some isotopic variants of sulfur trioxide. Results and analysis for the Raman[a] and infrared[b] bands of the parent isotopomer have been published recently. Here, results and analysis of the infrared absorption spectra of the ν_3 and $2\nu_3$ bands of $^{32}S^{18}O_3$ and $^{34}S^{18}O_3$ recorded separately at a resolution of $0.002\ \mathrm{cm}^{-1}$will be presented. For $^{32}S^{18}O_3$, ν_3 is centered at $1348.85320(3)\ \mathrm{cm}^{-1}$with $B' = 0.30879466(7)\ \mathrm{cm}^{-1}$, $C' = 0.15436012(6)\ \mathrm{cm}^{-1}$and $C'\zeta = 0.0795934(4)\ \mathrm{cm}^{-1}$. The $l = \pm 2$ component of the first overtone of ν_3 is centered at $2692.8899(3)\ \mathrm{cm}^{-1}$with $B' = 0.307815(1)\ \mathrm{cm}^{-1}$, $C' = 0.1538331(7)\ \mathrm{cm}^{-1}$and $C'\zeta = 0.078716(2)\ \mathrm{cm}^{-1}$. For $^{34}S^{18}O_3$, ν_3 is centered at $1330.07810(1)\ \mathrm{cm}^{-1}$with $B' = 0.3088233(3)\ \mathrm{cm}^{-1}$and $C' = 0.15437917(3)\ \mathrm{cm}^{-1}$, and $C'\zeta = 0.0770680(3)\ \mathrm{cm}^{-1}$. The $l = \pm 2$ component of the first overtone of ν_3 is centered at $2655.45735(4)\ \mathrm{cm}^{-1}$with $B' = 0.3078634(8)\ \mathrm{cm}^{-1}$, $C' = 0.15386494(7)\ \mathrm{cm}^{-1}$and $C'\zeta = 0.0762487(3)\ \mathrm{cm}^{-1}$. The Hamiltonian for analyzing these bands including splitting and perturbing terms and other fit constants will be presented.

[a] E. t.H. Chrysostom, N. Vulpanovici, T. Masiello, J. Barber, J. W. Nibler, A. Weber, A. Maki, T. A. Blake, *J. Mol. Spectrosc.* **210**, 233 (2001).

[b] A. Maki, T. A. Blake, R. L. Sams, N. Vulpanovici, J. Barber, E. t.H. Chrysostom, T. Masiello, J. W. Nibler, A. Weber, *J. Mol. Spectrosc.* **210**, 240 (2001).