

## LASER-INDUCED PHOSPHORESCENCE OF SO<sub>2</sub> IN SOLID NEON : DIRECT OBSERVATION OF THE $b^3A_2$ STATE

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Dispersed phosphorescence spectra of the transition  $a^3B_1 - X^1A_1$  of <sup>18</sup>O-labeled SO<sub>2</sub> in solid Ne were recorded in the spectral region 388-478 nm during laser excitation. As zero-phonon lines are well resolved, we were able to identify all three vibrational modes of the  $X^1A_1$  state, and to monitor emission from a specific isotopomer (in particular <sup>16</sup>OS<sup>18</sup>O) to obtain its corresponding excitation spectra. The vibronic patterns of excitation spectra of S<sup>16</sup>O<sub>2</sub> and S<sup>18</sup>O<sub>2</sub> in the spectral range 351-388 nm are similar to those observed in the gaseous phase, with severely perturbed lines above  $a^3B_1$  (110) at 27005 cm<sup>-1</sup>. New lines in two groups were observed for <sup>16</sup>OS<sup>18</sup>O; they are identified as lines associated with the  $\nu_3$  of  $a^3B_1$  and of  $b^3A_2$ . These observations enable us to report  $\nu_3 = 922$  cm<sup>-1</sup> for  $a^3B_1$ ,  $\nu_2 = 315$  and  $\nu_1 = 771$  cm<sup>-1</sup> for  $b^3A_2$ , and a false origin at 26653 cm<sup>-1</sup> for the  $b^3A_2$  (001) -  $X^1A_1$  (000) transition of <sup>16</sup>OS<sup>18</sup>O.