HIGH-RESOLUTION LASER SPECTROSCOPY OF LEAD OXIDE (PbO) IN 400-450 NM

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We observed rotationally resolved excitation spectra of PbO for transitions from the X(0^+) $v'' = 0$ vibronic ground state in a wavelength range of 400−450 nm. PbO molecules were produced by laser ablation in a cold helium buffer gas. The cold environment was useful to resolve overlapping rotational bands of different vibronic states. Absolute transition frequencies were measured with the uncertainty of about 10 MHz by using an ultralow expansion etalon for the laser frequency calibration. Since the previous work [1], we have continued the measurement and have observed about 1000 lines so far. The transitions to the B(1) ($v' = 2 - 6$), A(0^+) ($v' = 6 - 8$), and C(0^+) ($v' = 0$) states were clearly assigned, and spectroscopic constants were determined precisely for three isotopic molecules ^{206}PbO, ^{207}PbO, and ^{208}PbO. We analyzed perturbation of the B(1) levels due to the spin-orbit interaction with other $\Omega = 1$ levels. In this talk, we will present these results and analyses, including the latest data.

[1] K. Enomoto, A. Fuwa, N. Hizawa, Y. Moriwaki, and K. Kobayashi, *J. Mol. Spectrosc.*, **339**, 12 (2017).