LASER INDUCED FLUORESCENCE AND PHOTOIONIZATION SPECTROSCOPY OF LiMg

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Heteronuclear diatomic molecules consisting of alkaline and alkaline-earth metals, such as LiMg have properties that make them potentially useful for ultra-cold molecule experiments. The $X^2\Sigma^+$ ground state of LiMg allows it to be manipulated by both magnetic and electric fields, and its non-zero dipole moment offers the possibility that it could be used in quantum computing devices. Current spectroscopic data for the excited states of LiMg are limited, consisting of a few vibrationally resolved bands of E-X and F-X systems[1]. Bound-free emission spectra have been attributed to the D-X and C-X transitions[2]. In the present study we have used resonantly enhanced two-photon ionization spectroscopy and laser induced fluorescence measurements to record rotationally resolved spectra for the E-X and F-X bands. Transitions to bound levels of the D state are reported for the first time. The ionization threshold for LiMg will be determined using photoionization efficiency spectroscopy.

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