DISPERSED LASER INDUCED FLUORESCENCE STUDY OF $CaNH_2$ AND $CaSH$ [a]

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The visible electronic transitions of the simple asymmetric top molecules CaSH and CaNH2 have been extensively studied both field-free [b], [c], [d] and in the presence of static electric field [e], [f]. The diagonal Franck Condon factors for these metal-centered transitions make these molecules appealing for optical cycling studies[f]. These molecules can be readily aligned in the laboratory frame with the application of relatively small static electric field because of their small asymmetry splitting, and relatively large permanent a- and b-components of the electric dipole moments making them attractive as venues for quantum simulation and for investigation of fundamental physics (e.g. parity non-conservation). Here we report on the analysis of the dispersed laser induced fluorescence spectrum induced by both high-resolution and medium resolution laser excitation of the A-X, B-X and C-X bands of $CaNH_2$ and the B-X and C-X transitions of $CaSH$. The experimentally determined branching ratios are compared to those predicted based on high-level electronic-structure calculations of potential energy surfaces. The molecules were generated via laser ablation/supersonic expansion and the 2D spectra (excitation *vs* DLIF) recorded. Implications for laser cooling of the species will be presented.

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