THE ELECTRONIC SPECTRA OF LaNH AND LaND

DENNIS J. CLOUTHIER, *Department of Chemistry, University of Kentucky, Lexington, KY 40506-0055*; ANTHONY J. MERER, *Department of Chemistry, University of British Columbia, 2036 Main Mall, Vancouver, BC, Canada V6T 1Z1*; SCOTT J. RIXON, *Department of Physics and Astronomy, University of British Columbia, 6224 Agricultural Road, Vancouver, BC, Canada V6T 1Z1*; THOMAS D. VARBERG, *Department of Chemistry, Macalester College, St. Paul, MN 55105*.

Electronic bands of the new molecules LaNH and LaND have been observed by laser-induced fluorescence following the reaction of laser-ablated La metal with NH_3 or ND_3 under supersonic jet-cooled conditions. High-resolution data for LaNH show that the ground state is $^2\Sigma^+$ ($b_{\beta S}$) with $B_0 = 0.305478\ (22)$ cm^{-1}. Extensive dispersed fluorescence data have given ground state vibrational frequencies for LaNH (LaND): ν_2 (bend) $= 462\ (354)$ cm^{-1} and ν_3 (La-N stretch) $= 755\ (744)$ cm^{-1}. Two electronic systems with origins near 658 and 823 nm, both of which appear to have $^2\Pi$ upper states, have been identified from spectra in the $525 - 875$ nm region.