ELECTRONIC SPECTRA OF $LiNH_3$ AND $YbNH_3$

N. BHALLA, L. VARRIALE, N. M. TONGE AND A. M. ELLIS, *Department of Chemistry, University of Leicester, Leicester, LE1 7RH, United Kingdom.*

Alkalis and several rare earth elements dissolve in liquid ammonia and yield solvated electrons. Despite efforts to understand the electronic structure of these solutions, they are still poorly understood. We are trying to tackle this issue by providing electronic structure information on basic entities that might be found in such solutions, using isolated metal-ammonia clusters in the gas phase as model systems. Here we report on two of the simplest clusters, $LiNH_3$ and $YbNH_3$, and present their electronic spectra for the first time. These spectra have been recorded via two-colour REMPI and/or photodepletion spectroscopy. The spectrum of $LiNH_3$, with $\tilde{A}$ - $\tilde{X}$ origin near 11,500 cm^{-1}, is quite complex, with both vibrational structure and evidence of $\tilde{B}$ - $\tilde{X}$ excitation nearby. A possible assignment will be presented. $YbNH_3$ has a simpler spectrum with origin near to 14,000 cm^{-1}. Nevertheless, as will be shown, the assignment for this cluster is also non-trivial.