WIDE-RANGE VISIBLE SPECTROSCOPY OF HIGH-SPIN ALKALI TRIMERS ON HELIUM DROPLETS, AND INTERPRETATION OF THEIR ELECTRONIC STRUCTURE

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We use helium droplets to assemble all possible combinations of trimers of potassium and rubidium (K_3, K_2Rb, KRb_2, Rb_3) in a quartet-spin state, and we measure their electronic excitation spectra in the range 10600–17400 cm^{-1}. We use two methods to separate overlapping spectra: visible-visible V-type double-resonance and mass-selective beam depletion. We observe and assign the laser-induced-fluorescence spectra of ten new bands. Assignment is backed by high-level *ab initio* calculations of the electronic levels structure of these molecules. Both experiment and calculations show highly regular patterns which we elucidate in terms of an electron-shell structure similar in spirit to that observed in Na clusters.[a]

[a] W. D. Knight, K. Clemenger, W. A. de Heer, W. A. Saunders, M. Y. Chou, and M. L. Cohen *Phys. Rev. Lett.* **52,** 2141 (1984).