LASER SPECTROSCOPY OF ALKALI-HELIUM EXCIMERS AND EXCIPLEXES IN LIQUID AND COLD GASEOUS HELIUM

T. YABUZAKI, *Department of Physics, Kyoto University, Kyoto, 606-8502, Japan*.

We report, at first, on our spectroscopic studies on alkali-helium excimers and exciplexes, which are formed by the laser-excitation of alkali atoms in a cold helium gas. By comparing the observed emission spectra with theory, individual vibrational spectrum could be assigned. The population distribution of vibrational states as a function of temperature (density) could be clearly obtained. We discuss also the difference of emission spectra in a He gas from those in superfluid helium, which we observed previously. Finally, the realization of alkali vapor cell at liquid helium temperature is mentioned, which is suitable for various fundamental researches. In this cell, gaseous alkali atoms are produced by the light-induced dissociation from alkali clusters on the cell walls by a weak cw light, where superfluid helium film plays an important role.