SPECTROSCOPY OF COLD MOLECULES PRODUCED BY VELOCITY FILTERING

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There is a great interest in researches on ultra-cold molecules, because translationally cold molecules would exhibit various new phenomena fundamentally important in physics and chemistry. Especially, cold molecules are useful for ultra-highresolution spectroscopy in order to resolve detailed spectral fine structures. However, the generation of translationally cold molecule is still difficult to achieve. In the present study, we have generated cold molecules whose mean translational energy is less than 100 mK by velocity filtering technique. We have used an electrostatic hexapole instead of a quadrupole originally employed by Rempe et al for velocity filtering. Low-field-seeking molecules whose kinetic energy is less than the Stark-potential barrier are guided by the hexapole and introduced in a detection chamber. The guided flux of $10^{11}\ s^{-1}$ with a longitudinal temperature of less than 100 mK were obtained. As an example of spectroscopy of cold molecules, laser induced fluorescence spectra of guided cold molecules will be discussed.