COLD MOLECULES OBTAINED BY He BUFFER GAS COOLING AND STARK VELOCITY FILTER.

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We selected slow velocity component from some polar molecules with a Maxwell-Boltzmann distribution at room temperature by using a pulsed nozzle and a quadrupole Stark guide. Time of flight spectrum gives us a velocity distribution after the velocity filter. The velocity distribution observed shows good agreement with theory based on second-order Stark effect. In case of H_2CO, the slowest component detected is 20 m/s, which corresponds to 1 K of the thermal energy. This result promises that mK cold molecules will become available by combining this technique with a pre-cooling process like He buffer gas cooling. We prepared a laser ablation source for that purpose, and confirmed collisional cooling process in a He buffer gas cell by using Doppler profile analysis of rapid scan spectroscopy.