Buffer Gas Cooling in Molecular Spectroscopy

Radzihovsky, Matthew

To improve the molecular spectral resolution, the gas of interest must be cooled to reduce thermal noise. A method of buffer gas cooling is used, where a noble gas (buffer gas) cooled by a cryogenic pump is flowed in with the gas of focus. This is an efficient and simple way of cooling a gas down to a few-Kelvin temperatures. We have studied which buffer gas provides the best spectral resolution comparing Helium to Neon. We find that despite the expected enhanced clustering advantages of Neon, Helium provides the least Doppler broadening, resulting in best spectral resolution.

Awards Won: