ALTERNATE GRADIENT FOCUSING AND DECELERATION OF LARGE MOLECULES

JOCHEN KÜPPER, KIRSTIN WOHLFART, FRANK FILSINGER, HENRIK HAAK, HENDRICK L. BETHLEM, and GERARD MEIJER, *Fritz-Haber-Institut der MPG, Faradayweg 4-6, 14195 Berlin, Germany*.

Over the last years, fascinating progress has been made in the spectroscopy of large molecules in general and the *building blocks of life*[a] in particular. Such studies allow a detailed understandig of the intrinsic physical and chemical properties of large, modular molecules. The preparation of cold, isolated samples of large molecules and the manipulation of their external degrees of freedom allow further investigations using high-resolution spectroscopy or scattering experiments. Our group has been developing methods to decelerate and store neutral, polar molecules using switched strong electric fields.[b] Here we show how these techniques can be applied to large molecules, i. e. molecules of biological relevance, for which all low-lying states are high-field seeking at the realized fields.
Using a novel, modular experiment for the Alternate Gradient deceleration and trapping of molecules in high-field seeking states metastable CO and benzonitrile (C_7H_5N) have been decelerated. The results of these experiments are compared to simulations and further experiments on the manipulation of the external degress of freedom of benzonitrile and large, modular molecules are discussed.

[a] Special issue "Biomolecules in the gasphase" *Eur. Phys. J. D* **20**(3), 309–626 (2002);
Special issue "Bioactive molecules in the gasphase" *Phys. Chem. Chem. Phys.* **6**(10), 2543–2890 (2004)
[b] H. L. Bethlem und G. Meijer, *Int. Rev. Phys. Chem.* **22**, 73–128 (2003)