A SELECTOR FOR STRUCTURAL ISOMERS OF NEUTRAL MOLECULES

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Large (bio)molecules exhibit multiple conformers (structural isomers), even under the cold conditions present in a supersonic jet. For various applications, i. e., scattering experiments, it would be highly desirable to prepare molecular packets of individual conformers. It is well-known that polar molecules can be manipulated using strong electric fields. Many techniques have been developed for the manipulation of small molecules in low-field-seeking quantum states. However, application of these techniques to large molecules is not straightforward, because, for larger molecules, all states are high-field seeking at the relevant electric field strengths. To manipulate the motion of large molecules one has to use alternating gradient (dynamic) focusing[a]. This method has been successfully demonstrated in the alternating gradient deceleration of benzonitrile[b], CO[c] and YbF[d]. Using the same alternating gradient focusing principle, applying switched electric fields in a quadrupole guide, we have set up a new experiment to spatially separate individual conformers of large molecules. This experiment exploits the different mass-to-dipole (m/μ) ratios, similar to a quadrupole mass-to-charge (m/q) filter for ions. In a proof-of-principle experiment, we have demonstrated the conformer selection of cis- and trans-3-aminophenol[e].

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[d] M.R. Tarbutt et al., *Phys. Rev. Lett.* **92** (2004), 173002
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