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 Building 28c, seminar room

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# Studying isomerization kinetics via broadband microwave spectroscopy

Isomerization reactions are a fundamental class of chemical transformations, and their understanding is essential for the detailed description of chemical reactions in general. Despite its, on the first glance, striking simplicity, the corresponding reaction rates are often difficult to predict. This arises from their non-statistical behavior, so that the widespread RRKM method is not valid anymore. High-level experimental data is needed to shed more light on this and to provide benchmark data for the improvement and development of more advanced theories.

Before the dynamics of isomerization reactions between the different structural isomers, i.e., conformers can be understood, they themselves have to be identified and characterized. For this, we have constructed a novel broadband rotational spectrometer, covering the 2-8 GHz range within a single acquisition. The obtained spectra allow us to investigate the conformational structures and preferences of large molecules. In a next step, we induce the isomerization by pumping the molecules above their isomerization barrier using a tunable infrared laser and then probing them using a chirped microwave pulse. Here, we will present the technique and report initial results on 15-crown-5 ether.

