Time-resolved rotational spectroscopy of carboxylic acids. Identification and quantification of the components from heating adipic acid Pablo Pinacho, Wenhao Sun, Daniel A. Obenchain, Melanie Schnell FS-SMP DESY. **Alexander von Humboldt** Stiftung/Foundation Experimental 0.10 Cyclopentanone Adipic acid self-reaction 0.05 -Intensity (mV) -0.05 Two forms of adipic anhydride from Adipic acid in the nozzle quantum-chemical calculations Rep. rate – 30 Hz Carrier gas - Neon 20000 24000 26000 18000 22000 Chair Backing pressure – 3 bars Frequency (MHz) T nozzle - 160 °C We were not expecting cyclopentanone Boat Three conformations of adipic acid Experimental Cyclopentanone from quantum-chemical calculations 0.010 -Adipic anhydride chair Adipic anhydride boat Adipic acid 0.005 Intensity (mV) Invisible to us Not found -0.005 -0.010 20400 18800 19200 19600 20000

Found experimentally

Frequency (MHz)

Both forms of the anhydride found experimentally