CAVITY RING DOWN MEASUREMENTS ON PROPYLENE OXIDE IN THE 3μm REGION

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Propylene oxide (also known as methyloxirane) is one of the simplest chiral molecules and also shows effects of internal rotation of its methyl group. It is a much studied molecule and has received much scientific attention in the past.
Propylene oxide has 24 fundamental vibrational modes, with each vibrational mode consisting out of thousands of ro-vibrational transitions.
So far, ro-vibrationally resolved experimental data for the vibrational spectrum however, have been quite sparse. To address this problem, there has recently been a strong effort in our research group to obtain jet-cooled ro-vibrationally resolved spectra of propylene oxide. In this way the CH_3 torsion, CH_2, CH_3 rocking and ring breathing fundamental vibrational modes have been investigated with different experimental techniques.
In this work we will present our efforts in obtaining a continuous jet-cooled spectrum of propylene oxide in the 3μm region with a cw-OPO cavity ringdown spectrometer and report about our latest progress in analysing the C-H stretching group in the 3μm region. In the measured spectrum, various combination bands have also been observed, whose impact on neighbouring vibration bands will also be discussed.