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During the short visit the electronic and vibrational excitation of the sugar molecule D-ribose should be studied by means of electron energy loss spectroscopy (EELS) in the gas phase. But it turned out that during heating of the sample water was released that prevented proper measurements. For this reason we

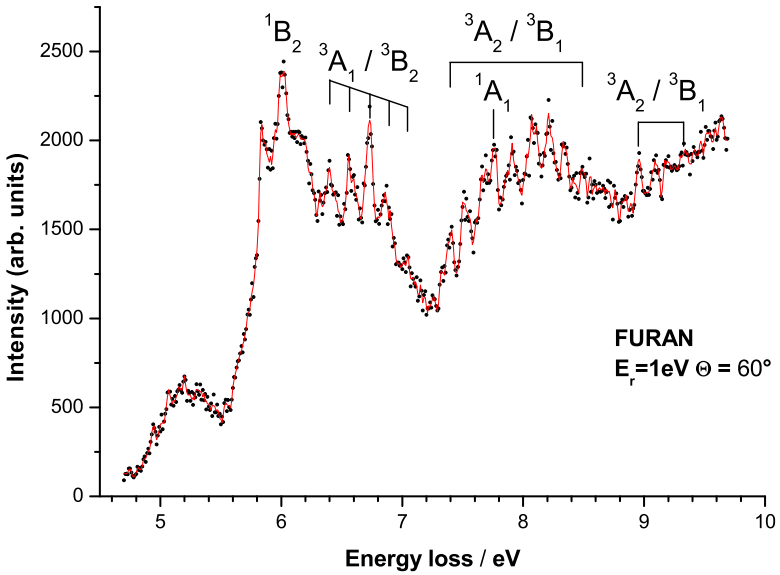

Figure 1: Electronic excitation of furan at $E_r = 1$ eV and $\theta = 90$ °, extended to 10 eV electron energy loss.

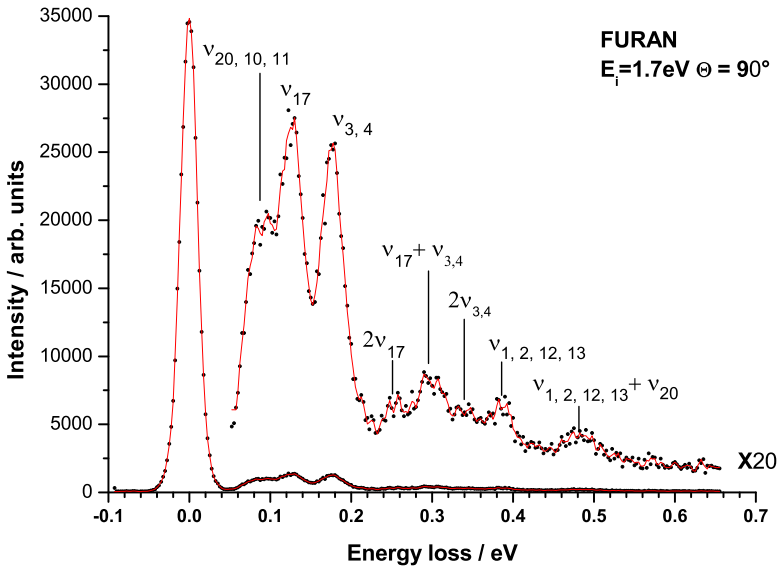

Figure 2: Vibrational excitation of furan at E_i = 1.7 eV and θ = 60 °.

chose another molecule - furan - that was studied already in our laboratory in Berlin with respect to dissociative electron attachment. The electronic and vibrational excitation of furan was previously studied[1, 2], but it was possible to improve and complete existing spectra.

Electronic excitation was measured in the constant residual energy mode with electron energy resolution of 25 - 35 meV at different angles and residual energies. To suppress the singlet excited states and thereby emphasise transitions to triplet states, measurements have been performed at large scattering angles (90 °, 60 °) and small residual energies (1 eV). Triplet states at 4.2 eV and 5.2 eV are well-known, additionally we were able to record triplet states up to 10 eV (see fig. 1).

Resonance enhanced vibrational excitation was measured at incident energies of 1.7 eV (fig. 2) and 3.1 eV. At these energies π^*shape resonances have been observed previously using electron transmission spectroscopy (ETS) [3]. A clear enhancement of vibrational modes was observed at these energies. By using electron energy resolution of 22 - 25 meV and symmetry considerations of the involved resonances the observed peaks could be assigned using existing data in ref. [2]. Going from large scattering angles to small angles an enhancement

of dipole allowed vibrational modes was observed. Altogether the existing data could be completed especially for the resonance enhanced vibrational excitation making the short visit a full success. A publication about the new features observed is in progress.

References

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[2] Motte-Tollet, F.; Eustatiu, G.; Roy, D. *J. Chem. Phys.* **1996**, *105*(17), 7448–7453.

[3] Modelli, A.; Burrow, P. D. *J. Phys. Chem A* **2004**, *108*, 5721–5726.