

PUSHING THE LA-MB-FTMW TO THE LIMIT: CONTROLLED DOUBLE PULSE LASER ABLATION FOURIER TRANSFORM MICROWAVE SPECTROSCOPY

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In a quest for improving current laser-ablation devices in combination with molecular-beam Fourier-transform microwave spectroscopy (LA-MB-FTMW)^{a,b} we present a double pulse laser ablation system scheme to improve the experimental conditions during the ablation of any organic molecule. As a proof of concept, we determine the substitution structure (rs) of aspirin, with molecular beam Fourier transform microwave spectroscopy. Furthermore, to prove the universality of this technique we extended it to the study of metal clusters. As it will be shown, the main advantages of this set up are a considerable generation of neutral molecules/clusters with an excellent S/N ratio, a reduced integration time and a considerable damage reduction caused to the sample. This is possible due to a softer ablation occurrence. The benefits of using these two lasers scheme would be also beneficial for chirped pulse Fourier transform microwave (CP-FTMW) spectroscopy.

^aBermúdez, C.; Mata, S.; Cabezas, C.; Alonso, J. L., Tautomerism in Neutral Histidine. *Angew. Chem. Int. Ed.* 53, 11015–11018 (2014)

^bSanz, M. E.; Cabezas, C.; Mata, S.; Alonso, J. L. Rotational Spectrum of Tryptophan. *J. Chem. Phys.*, 140 (20), 204308 (2014).