

# Fluoroacetylenes and Deuteriofluoroacetylenes, Synthesized in a Pulsed Discharge Nozzle; a Molecular Beam Fourier Transform Microwave Spectroscopy Study Combined with Quantum Chemical Calculations

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*Dedicated to Prof. Dr. A. Guarnieri on occasion of his 70th birthday.*

We report on the production of fluoroacetylene by an elimination reaction of 1,2-fluoroethene as precursor in an electrical discharge. The substance was identified and investigated by molecular beam Fourier transform microwave spectroscopy. Also fluorodiacetylene and with deuterium, D<sub>2</sub>, as additional precursor fluoroacetylene-d1 and fluorodiacetylene-d1 were synthesized in the beam plasma. The hfs of the rotational transitions provided spin-rotation and deuterium nuclear quadrupole coupling constants. The experimental quadrupole coupling constants are compared to vibrationally corrected ab initio values.

*Key words:* Reactions and Syntheses in Electric Discharges; Nuclear Quadrupole and Spin-rotation Coupling; Molecular Beam Fourier Transform Microwave Spectroscopy; *ab initio* Calculations.