

MICROWAVE SPECTRA OF FOUR NEW PERFLUOROMETHYL POLYNYNE CHAINS: TRIFLUOROPENTADIYNE, $\text{CF}_3\text{-C}\equiv\text{C-C}\equiv\text{C-H}$, TRIFLUOROHEPTATRIYNE, $\text{CF}_3\text{-C}\equiv\text{C-C}\equiv\text{C-C}\equiv\text{C-H}$, TETRAFLUOROPENTADIYNE, $\text{CF}_3\text{-C}\equiv\text{C-C}\equiv\text{C-F}$, AND TRIFLUOROMETHYLCYANOACETYLENE, $\text{CF}_3\text{-C}\equiv\text{C-C}\equiv\text{N}$

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Four fluoromethyl polyynes, 5,5,5-trifluoro-1,3-pentadiyne, $\text{CF}_3\text{-C}\equiv\text{C-C}\equiv\text{C-H}$, 7,7,7-trifluoro-1,3,5-heptatriyne, $\text{CF}_3\text{-C}\equiv\text{C-C}\equiv\text{C-C}\equiv\text{C-H}$, 1,5,5,5-tetrafluoro-1,3-pentadiyne, $\text{CF}_3\text{-C}\equiv\text{C-C}\equiv\text{C-F}$, and 4,4,4-trifluoro-1-nitrile-2-butyne, $\text{CF}_3\text{-C}\equiv\text{C-C}\equiv\text{N}$, were studied by pulsed-jet Fabry Perot Fourier transform microwave spectroscopy. The molecules were produced by pulsed high voltage discharges of dilute mixtures of precursor gases such as trifluoropropyne in an argon carrier pulsed jet. The carbon-13 and deuterium substituted isotopomers of trifluoropentadiyne were studied and the molecular structure was determined.