SOME EFFECTS OF SUCCESSIVE FLUORINATION ON 1-IODOPROPANE

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Fourier transform radiofrequency and microwave spectroscopies have been used to record the pure rotational spectra of 1-iodo-3,3,3-trifluoropropane (I3FP) and 1-iodo-2,2,3,3,3-pentafluoropropane (I5FP). In both cases the compound of interest was seeded in a supersonic expansion of argon gas issued from a pulsed solenoid valve. Several hundred transitions have been recorded for both species. Using the same instrumentation we have also remeasured several rotational transitions for 1-iodopropane for which $gauche$ and $trans$ conformers are visible; previous workers have shown that the $gauche$ conformer of 1-iodopropane is the most stable. The substitution of three fluorines for the hydrogens on C_3 of 1-iodopropane has the effect of locking the CCCI dihedral angle into the $trans$ conformer for the fluorinated species in our experiments. Further observations have shown that the largest component of the dipole moment lies along the a-axis for $trans$-1-iodopropane, but lies along the b-axis for $trans$-I5FP, switching back along the a-axis for $trans$-I3FP (but presumeably in the opposite direction than in 1-iodopropane). Spectroscopic constants will be presented and discussed.