MICROWAVE SPECTRUM, BROMINE NUCLEAR QUADRUPOLE COUPLING CONSTANTS, AND STRUCTURE OF BROMODIFLUOROMATHANE

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Microwave spectrum of bromodifluoromathane, $CHBrF_2$ (Freon FC-22B1), for the ^{79}Br and ^{81}Br species has been studied by a Stark modulation spectrometer. The spectrum consists of strong *c*-type and weak *a*-type transitions. A simultaneous least-squares analysis of the observed transition frequencies gave the rotational, quartic centrifugal distortion, and bromine nuclear quadrupole coupling constants. The structural parameters has been calculated from the rotational constants for the ^{79}Br and ^{81}Br species. The r_{F-F} distance for the ^{79}Br and ^{81}Br species are 2.171843 Å and 2.171849 Å, respectively. These distance are slightly longer than the corresponding value 2.17053 Å in $CHClF_2$. The electronic characters of the C−Br bond have been determined from the bromine nuclear quadrupole coupling constants and are compared with those of other related molecules.