reaction (2) is approximately three times greater than that in reaction (1).

*We make use of this opportunity to express our thanks to B. S. Neganov for help rendered to us in conducting this experiment.

** The geometry of our γ-detector allows detection of all electrons of energy > 10 mev emitted in a cone of opening angle 40°.

*** On the assumption of an isotropic angular distribution of π^0-mesons Eq. (3) tells us that the cross section for formation of π^0-mesons from carbon is $\sigma_c^{\pi^0} = 27.4 \pm 6.7 \times 10^{-27}$ cm^2.

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Microwave Spectrum of the C_2H_5Cl Molecule

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WE have carried out a preliminary study of the rotational spectrum of the C_2H_5Cl molecule. A short communication on the spectrum of this molecule was published by Wagner and Dailey[1], who studied the transitions $1_{11} - 2_{12}$, $1_{10} - 2_{11}$, $2_{22} - 3_{32}$ and $2_{20} - 3_{21}$ in the $C_2H_5Cl^{35}$ molecule, and the $1_{11} - 2_{21}$ and $1_{10} - 2_{11}$ transitions in the $C_2H_5Cl^{37}$ molecule. From these transitions they obtained the values of the rotational constants B and C, as well as the magnitudes of the quadrupole bonds along the principal axes of inertia.

We have studied additional transitions whose frequencies have the following values, neglecting the effects of quadrupole interactions:

Molecule	Transition	Observed Frequency (mc/sec)
$C_2H_5Cl^{35}$	$0_{00} - 1_{01}$	10 246.20 ± 0,05
$C_2H_5Cl^{35}$	$1_{01} - 2_{02}$	20 903.80 ± 0,04
$C_2H_5Cl^{37}$	$0_{00} - 1_{01}$	10 456.00 ± 0,05

The frequency of the transition line $0_{00} - 1_{01}$ coincides with the frequency calculated from the the values for B and C given in reference 1*.

The frequency of the transition $1_{01} - 2_{02}$ depends on the rotational constant A; calculation gave the value A = 30,940 ± 200 mc/sec. The low accuracy in the determination of A is due to the fact that A enters into the value of the transition frequency $1_{01} - 2_{02}$ as a small correction of the form $(B - C)^2/A$, and the magnitudes of B and C are very similar. Note that, in general, the accuracy of determining A is always small if it is determined from transitions involving a change in the dipole moment μ_a. We propose to observe transitions involving the measurement of μ_b. Although these transitions give less intense lines, they provide a more accurate determination of A.

Using the transition $0_{00} - 1_{01}$, we have determined the dipole moment μ_a of the $C_2H_5Cl^{35}$ molecule from the Stark splitting of the line which has the hyperfine structure $F = 3/2 - 5/2$, at applied fields of 195 v/cm and 292 v/cm. The calculation of μ_a was carried out using the "weak field" formula. The value found for μ_a was 1.79 ± 0.05 D.

* The rotational constants for $C_2H_5Cl^{37}$ given in reference 1 are incorrect, and were therefore calculated directly from the line frequencies given therein.

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