TABLE I

POLARITY OF ω-HYDROXYDECANOIC ACID POLYMERS

Molecular weight	n (monomeric units)	$\mu_{\text{calcd.}} \times 10^{18}$	$\mu_{\text{obsd.}} \times 10^{18}$
905	5	4.2	5.0
2,120	12	6.6	6.7
4,140	24	9.1	10.2
7,780	46	12.4	12.4
9,070	53	13.3	15.7
13,900	82	16.4	19.0

of the molecule are rotating in the electrical field and are the main source of the observed orientation polarization. Consistent with this explanation, polarization per gram for these polymers is found to be independent of molecular weight and dipole moment varies with the square root of molecular weight. The dielectric behavior suggests that these polymeric molecules have the form of flexible chains.

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RECEIVED JULY 9, 1937

THE ADDITION OF THIOCYANIC ACID TO OLEFINIC DOUBLE BONDS

Sir:

In pursuance of a general plan of research on the reactions of olefinic double bonds being carried out in this Laboratory, we were led by the absence of work on the addition of thiocyanic acid to simple olefins to examine the behavior of this substance. We have succeeded in adding thiocyanic acid to a number of olefins.

An ether solution of thiocyanic acid prepared according to Klason [*J. prakt. Chem.*, [2] **35,** 407 (1887)] with an equimolar amount of isobutylene yielded after four hours at room temperature an oil boiling at 51–54° at 25 mm.

Anal. Calcd. for C_5H_9NS: C, 52.17; H, 7.82. Found: C, 52.08; H, 7.81.

This product we have characterized as a mixture of *t*-butyl thiocyanate and *t*-butyl isothiocyanate through their derivatives, *t*-butyl-N-acetyldithiocarbamate of m. p. 113° [Wheeler and Merriam, THIS JOURNAL, **24,** 680 (1902)] and *t*-butylthiourea of m. p. (decomp.) 168° [Rudneff, *Ber.*, **12,** 1023 (1879)], respectively. When our product was treated in aqueous alcohol with silver nitrate for two, five, or ten minutes, the amount of silver thiocyanate formed by both volumetric and gravimetric determinations corresponded to 32% of *t*-butyl thiocyanate in our mixture, assuming that this compound was the sole source of the precipitate. Upon allowing our product to stand for thirty-six hours at room temperature with excess ammoniacal silver nitrate in aqueous alcohol [Meyer, "Analyse und Konstitutionsermittlung organischer Verbindungen," J. Springer, Berlin, 1931, p. 633], the amount of silver precipitated as the sulfide (determined volumetrically after proper deduction for the amount present as silver thiocyanate) corresponded to 62% *t*-butyl isothiocyanate in our product. We have not yet accounted for the remaining 6% and the possibility exists that isobutyl compounds may be present in small amount. We have modified the directions of Wheeler and Merriam for the preparation of *t*-butyl thiocyanate by keeping the reaction mixture at 0°, and found that the product boiled at 53–54° at 25 mm. and contained 42% *t*-butyl thiocyanate, determined as described above.

In similar fashion we found that trimethylethylene, styrene, 2-pentene and camphene add thiocyanic acid. The latter compound recalls the work of Challenger, Smith and Paton [*J. Chem. Soc.*, **123,** 1055 (1923)] who observed that pinene reacts with thiocyanic acid to yield "a substance...containing nitrogen and sulfur." Since this substance was never further identified, we assume that these authors have abandoned the investigation.

We propose to study the addition of thiocyanic acid to olefinic double bonds both intensively and extensively with emphasis on the effect of peroxides and other catalysts on addition and rearrangement.

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ISOLATION OF ERYTHROIDINE, AN ALKALOID OF CURARE ACTION, FROM ERYTHRINA AMERICANA MILL.

Sir:

It was known long ago by Altamirano [*Gaceta Medica De Mexico*, **23,** 369 (1888)] that extracts of the seeds of *Erythrina americana* Mill. produce a strong curare action, *i. e.*, a selective paralyzing action on motor nerve endings of striated muscle. Thus, the use of such an extract was suggested as a substitute for curare, which has been used therapeutically against tetanus and other con-