Taking the coefficient of viscosity of methane at 20°C to be 109.7 micropoise, it is seen that $\epsilon=1.33$.

It is known that the variation of η with temperature for molecules repelling each other as the inverse nth power of their separation is

$$\eta \propto T^s$$

where, as shown by Rayleigh,[2]

$$s=(n+3)/(2(n-1).$$

If η is plotted as a function of T for the various values listed in the International Critical Tables for methane, it is found that s is very nearly unity. This then gives $n=5$, which results in a value of 1.543 for ϵ, according to an expression derived by Chapman and Cowling.[3] This is a wider divergence from our value than can be explained by experimental error. It should also be pointed out that because of the large thermal diffusion effect one would expect $n>5$ and an ϵ in better agreement with the value reported here.

A possible significant result of this work lies in the fact that the value of 1.33 for ϵ in the case of methane agrees within the limits of our precision with the value of 1.31 found for uranium hexafluoride. No conclusions can as yet be drawn regarding this agreement; however, further work is being undertaken to evaluate the self-diffusion coefficients of a number of gases, from which it is hoped that the true nature of ϵ may be established. An important case to be investigated is that of ammonia at room temperature, which has been shown by Watson and Woernley[4] to exhibit a reversal of the thermal diffusion effect and hence should have an $\epsilon \simeq 1.54$.

We wish to express our thanks to Professor A. O. C. Nier, of the University of Minnesota, for his kindness in supplying the sample of heavy methane used in this experiment.

[1] E. P. Ney and F. C. Armistead, Phys. Rev. **71**, 14 (1947).
[2] Rayleigh, Proc. Roy. Soc. **A66**, 68 (1900).
[3] S. Chapman and T. G. Cowling, *Mathematical Theory of Non-Uniform Gases* (The Macmillan Company, New York, 1939), p. 172.
[4] W. W. Watson and D. Woernley, Phys. Rev. **63**, 181 (1943).

Magnetic Dipole Fields in Unstrained Cubic Crystals

L. W. McKeehan
Sloane Physics Laboratory, Yale University, New Haven, Connecticut
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LUTTINGER and Tisza[1] have recently made use of a few of the calculated values published some time since[2] under the above title. They mentioned discrepancies which tended to cast general doubt upon the accuracy of the earlier calculations. After correspondence, which clarified the exact character of these discrepancies, a check with the original work-sheets disclosed two misprints in Table II of the 1933 publication which now, therefore, requires the following corrections:

The numbers −2.13651 and 29.36734, appearing several times each in column 9 of Table II on page 916, should have been, respectively, −2.16351 and 29.36374.

This brings the values newly computed by Luttinger and Tisza into satisfactory agreement with what was done in 1933.

TABLE I. Additions to Table II of reference 2.

Column 1	*2*	*3*	*7*	*9*
(S)	100	1/4 1/4 0	4.18879	16.51841
			0	31.52037
			0	0
		0 1/4 1/4	4.18879	−20.47045
			0	0
			0	0
		1/4 1/4 1/2	4.18879	0.52690
			0	2.59919
			0	0
		1/2 1/4 1/4	4.18879	11.51257
			0	0
			0	0

A further computation has been made of the values of h_i at two points, not on the boundary of a dipole domain, which are of interest from the new viewpoint. In the notation of the 1933 paper these new values may be added to its Table II in the form given in Table I.

The components of a characteristic function $\mathbf{S}(\mathbf{r})$ in the notation of Luttinger and Tisza may be found by subtracting entries in column 7 from the corresponding entries in column 9. Care has to be taken to transpose the symbols in columns 2 and 3 and to change the order of entries in columns 7 and 9 to take care of the direction of dipole axes which may be assumed. Thus for dipoles parallel to the Z-axis, the newly computed entries give

$$S_z(0,\ 1/4,\ 1/4)=16.51841-4.18879=12.32962$$
$$S_y=(0,\ 1/4,\ 1/4)=31.52037-0=31.52037$$
$$S_y(1/2,\ 1/4,\ 1/4)=2.59919-0=2.59919.$$

While not affecting the most recent comparison of results, it is desirable to point out two further mistakes in the 1933 paper. In Eqs. (13)–(17) on page 919, a negative sign should precede each symbol h, e.g., h_{iit2}. In the description of Fig. 1, on page 914, r_2 and r_3 should be transposed, so that the equations in the parentheses will read $r_1=r_3=-1$, $r_2=1$.

[1] J. M. Luttinger and L. Tisza, Phys. Rev. **70**, 954 (1946).
[2] L. W. McKeehan, Phys. Rev. **43**, 913 (1933).

Ultrasonic Absorption from 75 to 280 Mc/sec.*

Robert A. Rapuano
Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, Massachusetts
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MEASUREMENTS of ultrasonic absorption in liquids at frequencies up to 100 Mc/sec. have been reported in the literature. The present note is a preliminary report of absorption measurements between 75 Mc/sec. and 280 Mc/sec. The pulse-echo method[1] has been adapted for this work by the use of a solid acoustic delay line.

Acoustic echoes are received from a reflector placed in the path of an ultrasonic beam set up in fluid which is contained in a tank. Attenuation is determined by measuring, with a calibrated attenuator, the amplitude of the received echo as a function of the separation of the reflector and transducer. The transducer is an x-cut quartz crystal