use of an alternating field. Certainly it is possible to produce magnetic specimens with a well-defined magnetic axis and a relaxation time of less than 200 millimicroseconds in an applied field of twice the coercive field.

These experiments show that the variation of the coercivity of thin films during formation is not a simple relation as given by Néel[1] but is influenced very strongly by secondary effects such as the nature of the substratum.

An apparatus similar to that described above has also been developed by K. E. Drangeid.

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[2] Tiller, C. O., and Clark, G. W., *Phys. Rev.*, **110**, No. 2, 583 (1958).
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Examination of Particulate Matter on Filter Membranes

Fine filter membranes with maximum pore sizes less than 1μ are now readily available for collecting solid material suspended in a liquid. As the membranes are of very uniform thickness, they may be examined under a microscope for the determination of the sizes and nature of the particles deposited on them. We have used a simple and effective technique for preparing slides incorporating the sample membrane. The essential feature of the method is that the membrane is made transparent to permit the use of transmitted light without disturbing the particle distribution.

A water ejector pump is usually used to assist filtration. By keeping this running the membrane may be dried in a few minutes. With the suction still applied, a fixative is poured down the side of the filter funnel so as to spread steadily across the membrane and be drawn through it. The forces acting on the particles are such that these are held against the membrane and are not disturbed by the advancing liquid front. The fixing process is complete when the fixative has been drawn through the membrane and the latter is again dry.

With the correct choice of fixative the membrane retains its porosity, and is thus capable of being rendered transparent by saturation in Canada balsam diluted with xylene. It can be mounted as desired without fear of disturbing the particles. We have used a solution of 0·5 per cent (w) 'Perspex' in chloroform as the fixative, and found it to be eminently suited to our application.

Where an automatic particle counter is used care must be taken to choose a membrane exhibiting negligible grain when treated, and to ensure that the drying processes are carried to completion, otherwise blotches caused by trapped air or liquid other than balsam may result in counting-errors.

We wish to thank the Directors of 'Shell' Research, Ltd., for permission to publish this communication.

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Refractivity and Lattice Constant Ratios of Lithium-6- and Lithium-7-rich Fluorides

The Industrial Group of the United Kingdom Atomic Energy Authority has provided small quantities of lithium compounds, containing different proportions of the isotopes lithium-6 and lithium-7, for use by its Research and Development Laboratories at Capenhurst.

Some of the material has been converted to lithium fluoride, and the refractivity of vacuum-grown crystals containing respectively (*A*) 90 per cent lithium-6, and (*B*) 95 per cent lithium-7, has been determined in the Natural Philosophy Department, Aberdeen, using a Hilger–Watts 'Research' pattern spectrometer, with 6·5 in. diameter glass circle. Prism *A* has faces 22 mm. × 26 mm., and prism *B*, 35 mm. × 26 mm. The observations were reduced to a uniform temperature of 21° C., and to standard atmospheric pressure.

Table 1. Variation of Refractive Index of Lithium Fluoride with Wave-length

λ (A.)	$n(A)$ (90 per cent lithium-6 fluoride)	$n(B)$ (95 per cent lithium-7 fluoride)	$n(N)$ (normal lithium fluoride)
4471·48	$1{\cdot}39618_{4(6)}$	$1{\cdot}39631_{2(4)}$	1·396310
5015·68	$1{\cdot}39414_{9(7)}$	$1{\cdot}39428_{6(4)}$	1·394289
5893·7	$1{\cdot}39189_{8(6)}$	$1{\cdot}39206_{2(7)}$	1·392066
6678·15	$1{\cdot}39049_{7(2)}$	$1{\cdot}39068_{5(3)}$	1·390683

Table 1 gives indices for four wave-lengths. Each value is the mean of three independent mean values, obtained from measurements on all three angles of the prism. The bracketed figures are the average residual errors (× 10^6). The overall error was 5 × 10^{-6} for prism *A* and 4 × 10^{-6} for prism *B*. The last column, with values for the refractive index of normal lithium fluoride, is from measurements by Tilton and Plyler at the National Bureau of Standards[1].

Table 2. Variation with Wave-length of Refractive Index Differences

λ (A.)	$n(B) - n(A)$	$n(N) - n(A)$	$n(B) - n(N)$
4471·48	12·8 × 10^{-5}	+ 12·6 × 10^{-5}	+ 0·2 × 10^{-5}
5015·68	13·8	+ 14·1	− 0·3
5893·7	16·4	+ 16·8	− 0·4
6678·15	18·8	+ 18·6	+ 0·2

Table 2 shows the difference in refractivity between the enriched specimens *A* and *B*, and also between these and normal lithium fluoride. The major variation of 85 per cent in the proportion of lithium-7 from *A* to *B* produces an effect which varies from 13 to 19 × 10^{-5} in the range considered. Hence the difference of 2·4 per cent between *B* and normal lithium fluoride (92·6 lithium-7) should produce a shift of $n(B) - n(N)$ only ranging from 0·36 to 0·53 × 10^{-5} which is of the same order as the error. Moreover, Tilton and Plyler[1] found that there are small variations in the fifth decimal place between prisms of normal lithium fluoride, so that the close agreement shown in the last column between $n(B)$ and $n(N)$ is satisfactory.

The difference in refractivity increases with wave-length and can be fitted closely to an expression $x + y\lambda^2$. Using the least squares method, the values for $n(B) - n(A)$ are $x = 7{\cdot}723$, $y = 24{\cdot}83$ and for $n(B) - n(N)$, $x = 7{\cdot}870$, $y = 24{\cdot}60$. It is suggested