TABLE I.

Ratio of ionization in the gases:	Earlier measurements			This work	
	α-particles			α-particles	Fission fragments
	Schmieder	Naidu	Gurney		
N₂:A	0.675	0.67	0.71	0.68	0.69
Xe:A		0.97	1.22	1.18	1.21

differences may be ascribed to uncertainty due to statistical errors; also, the differences in the ordinates are only slightly larger than could be explained by uncertainty, but it is remarkable that curve 2 (argon) has the highest maxima and the lowest minimum, while the opposite is valid for curve 1 (nitrogen). This indicates that the straggling is lowest in argon and highest in nitrogen.

By use of the same ionization chamber the ratio between the ionization produced by α-particles from ThC and ThC' in nitrogen and argon was found to be 0.68 ± 0.03. In order to minimize the consumption of xenon a second ionization chamber of smaller volume was used to compare the ionization in xenon and argon by α-particles; the ratio was found to be 1.18 ± 0.05. These figures are in good agreement with earlier results for α-particles given by Schmieder,[8] and by Gurney,[9] while the agreement with the work of Naidu[10] is not perfect. The figures are given in Table I.

The measurements were carried out at the Institute of Theoretical Physics in Copenhagen and I wish to express my best thanks to the Director of the Institute, Professor Niels Bohr, as well as to Professor I. C. Jacobsen for placing the cyclotron at my disposal and for the excellent working conditions. My thanks are also due to Mr. Søren Madsen and to Mr. Alex. Holst, Director of Norsk Hydro, who presented the argon and the xenon.

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Effect of Ultraviolet Light on Glass Containing Silver

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IT was pointed out several years ago by H. E. Ives that the Lippmann color photograph process could be used to produce plates which would reflect monochromatic light when illuminated with white light. Additional investigations of this phenomenon were conducted by R. W. Wood.

In some of our work dealing with colorless silicate glasses containing small amounts of silver, we have found that ultraviolet light will cause the silver to precipitate in the glass if the latter is maintained at a temperature of about 400°C. The colloidal silver produces an amber colored glass. Without illumination with ultraviolet light, the temperature necessary to cause the color to "strike" is considerably higher.

We have made some attempts to produce standing waves in colorless glasses containing silver by forming a platinum mirror on one face of a polished disk which was then heated in a furnace to about 400°C. Light from a quartz-mercury arc lamp was used to illuminate the disk through the open top of the furnace. If silver were precipitated at the antinodes of the standing waves, we might expect that the treated glass would reflect the mercury spectrum. However, no such result could be observed. This failure is ascribed to the low concentration of silver (ca. ¼ percent) in the glass.

Another interesting speculation is the possibility of producing a glass surface which would not reflect visible light by illumination with filtered ultraviolet light under the above conditions.

Ultrasonic Dispersion and Absorption in Hydrogen

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MEASUREMENTS made in this laboratory with the variable-path ultrasonic interferometer show that there is a region of dispersion of the velocity of sound in hydrogen at ordinary temperatures and pressures beginning in the frequency region of 4–6 Mc. Illustrative values are given in Table I.

TABLE I. Velocity of sound in H_2 at 25°C.

f(Mc)	p(Atmos.)	V(m/sec.)	±S.D. of mean, (percent)
3.855	1.00	1321.9	0.082
	.50	1349.9	0.31
6.254	1.00	1365.0	0.24
	.50	1382.0	0.26
Classical		1315.8	

The increase in velocity is accompanied by an increase in absorption which is 10–25 times the already large classical value. This anomalous absorption has already been observed by van Itterbeek[1] and co-workers at lower frequencies and temperatures, but was not accompanied by reproducible observation of dispersion of velocity.

These effects are attributed to lag of energy exchange to and from the rotational states of the hydrogen molecule. Application of the theory, for example, Kneser's[2] dispersion formula, to these results, gives an inflection point in the V^2 vs. log f curve at 10.95 ± 8 percent Mc and places the upper limit of the dispersion region at about 40 Mc.

Complete reports will be submitted soon.

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