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ANNUAL REPORT OF THE INTERNATIONAL COMMITTEE ON ATOMIC WEIGHTS, 1911.

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In the autumn of 1909 the Council of the Chemical Society of London voted unanimously in favor of issuing the annual report of the International Committee on Atomic Weights in September or October instead of in January, as heretofore. In that proposition the Chemical Society of France has concurred, and American sentiment has also been favorable to the suggested change. Therefore the change is now made.

The reasons offered for the new policy are very simple: First, the school year, at least in most educational institutions, begins in the autumn. It is desirable that teachers should then have the latest table of atomic weights at their command, in order to avoid changes after school work has begun. Secondly, publishers of text-books are accustomed to issue their new works in the autumn, and often request early information as to changes which are likely to be made. The proposed change in the time of issuing the table is therefore an aid to teachers, students and publishers, and no disadvantage to any one else. The immediate usefulness of the table is increased, and to attain that end should be a main purpose of the committee.

Since the preparation of the report for 1910, a number of important memoirs upon atomic weights have appeared. The results obtained are, in brief, as follows:

Chlorine.—The density, composition by volume, and compressibility of hydrochloric acid have been measured by Gray and Burt[1] with great care. From the density and volumetric composition, when H = 1.00762, Cl = 35.459. From the density and compressibility, Cl = 35.461.

[1] *J. Chem. Soc.*, **95**, 1633.

The mean, 35.460, is the value given in the annual table of atomic weights for the past two or three years.

The density of hydrochloric acid has also been determined by Scheuer,[1] who gives measurements made under varying conditions. His final conclusion, based upon his own work after comparison with that of Gray and Burt, is that Cl = 35.466.

Lithium.—Richards and Willard,[2] in their important research upon the atomic weight of lithium, measured three distinct ratios; namely, silver to lithium chloride, silver chloride to lithium chloride, and lithium perchlorate to lithium chloride. From these ratios, without the intervention of any others, the following independent values for three atomic weights are obtained:

Li =	6.939
Cl =	•35.454
Ag =	107.871

The value for silver varies from the accepted value, 107.88, by about one part in 12000, which is probably less than the actual uncertainty. That for chlorine diverges more widely, namely, by about one part in 6000. The new figures are undoubtedly entitled to great weight, but in view of the excellent work done by others it would be unwise to make any hasty change in the table. For lithium, however, the value 6.94 may be taken, replacing the old 7.00.

Strontium.—Thorpe and Francis,[3] in their determinations of the atomic weight of strontium, measured six ratios, and obtained the following results:

Ratio 2Ag to $SrBr_2$,	Sr = 87.645
Ratio 2AgBr to $SrBr_2$,	Sr = 87.653
Ratio 2Ag to $SrCl_2$,	Sr = 87.642
Ratio 2AgCl to $SrCl_2$,	Sr = 87.645
Ratio $SrBr_2$ to $SrSO_4$,	Sr = 87.629
Ratio $SrCl_2$ to $SrSO_4$,	Sr = 87.661
Mean of all,	Sr = 87.646

The value adopted by the authors is 87.65. Richards' figure is 87.62. An intermediate value, 87.63, is adopted in the new table.

Phosphorus.—Atomic weight redetermined by Baxter and Jones.[4] From the ratio between silver and silver triphosphate the authors find P = 31.043, when Ag = 107.88. The rounded-off figure 31.04 is to be adopted.

Vanadium.—From the ratio between silver chloride and vanadyl

[1] *Z. physik. Chem.*, **68**, 575.
[2] This Journal, **32**, 4.
[3] *Proc. Roy. Soc., London A*, **83**, 277.
[4] This Journal, **32**, 298.

trichloride, Prandtl and Bleyer[1] find V = 50.963 and 51.133 in two series of experiments.

In a later paper, Prandtl and Bleyer,[2] also from analyses of vanadyl trichloride, find V = 51.061. From reductions of V_2O_5 to V_2O_3 they found V = 51.374. The latter method, however, they regard as uncertain. The value V = 51.06 may be provisionally adopted.

Tellurium.—Marckwald and Foizik,[3] by a somewhat complex volumetric process, based on the oxidation of TeO_2 by $KMnO_4$, conclude that Te = 127.61. This agrees with many of the other recent determinations of the constant, but is not sufficiently exact to supplant the value given in the table.

Rhodium.—Two inaugural dissertations upon the atomic weight of rhodium have been issued from Gutbier's laboratory at Erlangen. Renz reduced rhodium pentammine bromide in hydrogen and found Rh = 102.92. H. Dittmar,[4] by similar reductions of the corresponding chloride, found Rh = 102.93.

Platinum.—The very elaborate investigation of Archibald[5] upon the atomic weight of platinum was based upon analyses of the chloroplatinates and bromoplatinates of potassium and ammonium. In all, 28 ratios were measured, giving values for Pt ranging between 195.19 and 195.25. Their arithmetical mean gives Pt = 195.22. Archibald, however, in his final discussion, uses only 12 ratios, giving, in mean, Pt = 195.23. The figure 195.2 is given in the table.

The Inert Gases.—The densities and molecular weights of helium and neon have been redetermined by Watson.[6] For the atomic weights he finds He = 3.994 and Ne = 20.200. In another paper[7] he applies the critical constants of krypton and xenon to their densities as determined by Moore, and finds Kr = 82.92 and Xe = 130.22. There are also new determinations of the density of argon, by Fischer and Hahnel.[8] Their mean value, referred to O = 16, is 19.945, a figure rather higher than that given by Ramsay and Travers. It corresponds to an atomic weight of A = 39.89.

It is also to be noted that a third, revised, edition of Clarke's "Recalculation of the Atomic Weights" has recently been published by the Smithsonian Institution.

[1] *Z. anorg. Chem.*, **65**, 152.

[2] *Ibid.*, **67**, 257.

[3] *Ber.*, **43**, 1710. See also Browning and Flint, *Am. J. Sci.*, [4] **28**, 347, who adduce evidence to show that tellurium is possibly complex.

[4] Reproduced in *Sitz. phys. med. Soz. Erlangen*, **40**, 184.

[5] *Proc. Roy. Soc. Edinburgh*, **29**, 721.

[6] *J. Chem. Soc.*, **97**, 810.

[7] *Ibid.*, **97**, 833.

[8] *Ber.*, **43**, 1435.

The annual table of atomic weights for 1911 follows, with but few changes from that of the preceding year.

International Atomic Weights, 1911.

	Symbol.	Atomic weight.		Symbol.	Atomic weight.
Aluminium	Al	27.1	Molybdenum	Mo	96.0
Antimony	Sb	120.2	Neodymium	Nd	144.3
Argon	A	39.88	Neon	Ne	20.2
Arsenic	As	74.96	Nickel	Ni	58.68
Barium	Ba	137.37	Nitrogen	N	14.01
Bismuth	Bi	208.0	Osmium	Os	190.9
Boron	B	11.0	Oxygen	O	16.00
Bromine	Br	79.92	Palladium	Pd	106.7
Cadmium	Cd	112.40	Phosphorus	P	31.04
Caesium	Cs	132.81	Platinum	Pt	195.2
Calcium	Ca	40.09	Potassium	K	39.10
Carbon	C	12.00	Praseodymium	Pr	140.6
Cerium	Ce	140.25	Radium	Ra	226.4
Chlorine	Cl	35.46	Rhodium	Rh	102.9
Chromium	Cr	52.0	Rubidium	Rb	85.45
Cobalt	Co	58.97	Ruthenium	Ru	101.7
Columbium	Cb	93.5	Samarium	Sa	150.4
Copper	Cu	63.57	Scandium	Sc	44.1
Dysprosium	Dy	162.5	Selenium	Se	79.2
Erbium	Er	167.4	Silicon	Si	28.3
Europium	Eu	152.0	Silver	Ag	107.88
Fluorine	F	19.0	Sodium	Na	23.00
Gadolinium	Gd	157.3	Strontium	Sr	87.63
Gallium	Ga	69.9	Sulphur	S	32.07
Germanium	Ge	72.5	Tantalum	Ta	181.0
Glucinum	Gl	9.1	Tellurium	Te	127.5
Gold	Au	197.2	Terbium	Tb	159.2
Helium	He	3.99	Thallium	Tl	204.0
Hydrogen	H	1.008	Thorium	Th	232.4
Indium	In	114.8	Thulium	Tm	168.5
Iodine	I	126.92	Tin	Sn	119.0
Iridium	Ir	193.1	Titanium	Ti	48.1
Iron	Fe	55.85	Tungsten	W	184.0
Krypton	Kr	82.92	Uranium	U	238.5
Lanthanum	La	139.0	Vanadium	V	51.06
Lead	Pb	207.10	Xenon	Xe	130.2
Lithium	Li	6.94	Ytterbium (Neoytterbium)	Yb	172.0
Lutecium	Lu	174.0	Yttrium	Yt	89.0
Magnesium	Mg	24.32	Zinc	Zn	65.37
Manganese	Mn	54.93	Zirconium	Zr	90.6
Mercury	Hg	200.0			

Signed, F. W. CLARKE,
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