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REPORT OF THE INTERNATIONAL COMMITTEE ON ATOMIC WEIGHTS.

BY F. W. CLARKE.

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IN the year 1900 an international committee on atomic weights was organized, composed of more than fifty representatives from chemical and other societies. Its conferences were necessarily conducted by correspondence, and the delays and difficulties of the work proved to be both serious and annoying. Accordingly, the committee, by vote, designated a smaller body of three representatives, and the latter now has the honor to report its recommendations.

On the fundamental question of standards, definite and formal action seems to be impracticable. By the original committee of the German Chemical Society the oxygen standard was adopted, but that proposal, while receiving strong support, also met with serious opposition. In fact, opinion, as expressed by individual voices, seems to be somewhat evenly divided upon this question, and around it there has already grown up a controversial literature of formidable proportions. To force the adoption of either standard, oxygen or hydrogen, appears therefore to be impossible, and for some time to come both are likely to be employed. Between them, experience must be the final arbiter. That standard which best serves to coördinate chemical and physical knowledge will ultimately be chosen, and the other will gradually fall into disuse. Meanwhile, it is important that the most probable values for the several atomic weights should be indicated, and that every table of them should be consistent within itself. Such a table has been prepared by our distinguished predecessors, and its revision, as knowledge advances, seems to be our proper function.

In order that our work may be of the most general service, we have prepared a table in which both standards of atomic weight are represented. In most of its details it is identical with the table which was reported by the previous committee at the beginning of the year 1902.[1] Some changes, however, have in our judgment become necessary, and these may be briefly indicated as follows: when O = 16.

Antimony. In the former reports of the Committee, the value derived by Cooke from analyses of the bromide, Sb = 120, was adopted. This, however, ignores the work of Cooke and of Schneider upon antimony trisulphide, and the still more recent determinations made by Friend and Smith. The true number being therefore in doubt, we recommend the use of an average value, and put Sb = 120.2.

Germanium. The number 72.5 is more nearly in accord with Winkler's determinations than the former number 72.

Hydrogen. In the column which represents the oxygen standard, hydrogen has heretofore been assigned the value 1.01. The number 1.008 is, however, much more exact, and the error in 1.01 is too large to be perpetuated. Each figure should be given to the nearest *significant* decimal.

Lanthanum. During 1902 two new determinations of the atomic weight of lanthanum were published. According to Jones, La = 138.77. Brauner and Pavlicek found La = 139.04. Both investigations were conducted with great skill and care, and each one seems to have some points of advantage over the other. The average, La = 138.9, appears to be the safest value to adopt. These data naturally influence our judgment in the case of cerium, and we retain the Brauner number, Ce = 140, rather than adopt the lower estimates made by other observers.

Mercury. Taking into account all of the determinations which

[1] In No. 1 of the *Berichte*, for 1902.

have appeared, and giving great weight to the most recent measurements by Hardin, we regard the value Hg = 200 as best warranted by the existing evidence.

Palladium. The atomic weight of this metal is in doubt. The best determinations give values ranging from 106 to 107. The mean between them, Pd = 106.5, has been provisionally adopted.

Radium. This element appears in the table for the first time. Madame Curie's determination of the atomic weight, Rd = 225, is probably not far from the truth.

Selenium. Judging from the work of Lenher, and the very recent determinations by Meyer, the former value, Se = 79.1, is probably too low. In order to give due weight to the newer measurements we write Se = 79.2.

Tin. The determinations by Bongartz and Classen, which seem to be the best, make Sn = 119. The former value, 118.5, is almost certainly too low.

Uranium. According to the very recent investigation by Richards and Merigold, U = 238.5.

Zirconium. The figure Zr = 90.6 is apparently the most probable.

In thus assuming the duties assigned to us by the larger International Commission, we act upon the conviction that the purpose of our appointment is to secure the promptness and efficiency which is only possible with a comparatively small working body. In order to carry out this purpose, we must depend upon the coöperation and assistance of our colleagues. We therefore beg that they, and all other chemists who are interested in researches upon atomic weights, will aid us with their criticisms and advice. We especially ask that publications upon the subject shall be sent to us, in triplicate if possible, so that no matter of importance may be overlooked. Without support of this kind our work cannot be made fully effective.

The complete table of atomic weights, with the foregoing changes incorporated, follows:

F. W. Clarke,
T. E. Thorpe,
Karl Seubert,
Committee.

1903.

INTERNATIONAL ATOMIC WEIGHTS.

		O = 16.	H = 1.
Aluminum	Al	27.1	26.9
Antimony	Sb	120.2	119.3
Argon	A	39.9	39.6
Arsenic	As	75.0	74.4
Barium	Ba	137.4	136.4
Bismuth	Bi	208.5	206.9
Boron	B	11.	10.9
Bromine	Br	79.96	79.36
Cadmium	Cd	112.4	111.6
Caesium	Cs	133.	132.
Calcium	Ca	40.1	39.8
Carbon	C	12.00	11.91
Cerium	Ce	140.	139.
Chlorine	Cl	35.45	35.18
Chromium	Cr	52.1	51.7
Cobalt	Co	59.0	58.56
Columbium	Cb	94.	93.3
Copper	Cu	63.6	63.1
Erbium	Er	166.	164.8
Fluorine	F	19.	18.9
Gadolinium	Gd	156.	155.
Gallium	Ga	70.	69.5
Germanium	Ge	72.5	71.9
Glucinum	Gl	9.1	9.03
Gold	Au	197.2	195.7
Helium	He	4.	4.
Hydrogen	H	1.008	1.000
Indium	In	114.	113.1
Iodine	I	126.85	125.90
Iridium	Ir	193.0	191.5
Iron	Fe	55.9	55.5
Krypton	Kr	81.8	81.2
Lanthanum	La	138.9	137.9
Lead	Pb	206.9	205.35
Lithium	Li	7.03	6.98
Magnesium	Mg	24.36	24.18
Manganese	Mn	55.0	54.6
Mercury	Hg	200.0	198.5
Molybdenum	Mo	96.0	95.3
Neodymium	Nd	143.6	142.5
Neon	Ne	20.	19.9
Nickel	Ni	58.7	58.3
Nitrogen	N	14.04	13.93

		O = 16.	H = 1.
Osmium	Os	191.	189.6
Oxygen........	O	16.00	15.88
Palladium	Pd	106.5	105.7
Phosphorus	P	31.0	30.77
Platinum	Pt	194.8	193.3
Potassium	K	39.15	38.86
Praseodymium .	Pr	140.5	139.4
Radium	Rd	225.	223.3
Rhodium	Rh	103.0	102.2
Rubidium......	Rb	85.4	84.8
Ruthenium	Ru	101.7	100.9
Samarium	Sm	150.	148.9
Scandium......	Sc	44.1	43.8
Selenium	Se	79.2	78.6
Silicon.........	Si	28.4	28.2
Silver..........	Ag	107.93	107.12
Sodium	Na	23.05	22.88
Strontium......	Sr	87.6	86.94
Sulphur	S	32.06	31.83
Tantalum......	Ta	183.	181.6
Tellurium	Te	127.6	126.6
Terbium	Tb	160.	158.8
Thallium	Tl	204.1	202.6
Thorium.......	Th	232.5	230.8
Thulium.......	Tm	171.	169.7
Tin	Sn	119.0	118.1
Titanium	Ti	48.1	47.7
Tungsten	W	184.	182.6
Uranium.......	U	238.5	236.7
Vanadium	V	51.2	50.8
Xenon.........	Xe	128.	127.
Ytterbium	Yb	173.0	171.7
Yttrium	Yt	89.0	88.3
Zinc	Zn	65.4	64.9
Zirconium	Zr	90.6	89.9

[CONTRIBUTIONS FROM THE LABORATORY OF THE PENNSYLVANIA STATE COLLEGE AGRICULTURAL EXPERIMENT STATION.]

VIII. SOME CUBAN SOILS OF CHEMICAL INTEREST.

BY WM. FREAR AND C. P. BEISTLE.

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SOME time since, the writer received from Mr. Luis Marx, a Cuban tobacco grower, samples of a deep red soil from the