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On the Complex Inorganic Acids, by WOLCOTT GIBBS, M. D.—In this article the author reports progress in his researches on the complex inorganic acids, of which he has made previous mention in the *American Journal of Science*, and in the *Berichte der deutschen chemischen Gesellschaft.* He is led, both by his own investigations and those of other chemists, to the adoption of a new classification and arrangement of the alkaline tungstates, which are divided into the normal and metatungstic series. The salts belonging to the former class are represented by the following typical formulas:

$$WO_3Na_3O + 2\ Aq.$$
$$2\ WO_3Na_2O + 6\ Aq.$$
$$3\ WO_3Na_2O + 4\ Aq.,$$

the metatungstic series comprising the following:

$$4\ WO_3Na_2O \quad + 10\ Aq.$$
$$6\ WO_3\ 2\ BaO \quad + 12\ Aq.$$
$$8\ WO_3\ 3\ (NH_4)_2O + 8\ Aq.$$
$$10\ WO_3\ 4\ Na_2O \quad + 23\ Aq.$$
$$12\ WO_3\ 5\ Na_2O \quad + 28\ Aq.$$
$$14\ WO_3\ 6\ Na_2O \quad + 42\ Aq.$$

This classification is also applicable to the alkaline molybdates, with some slight modifications. In addition to the above, a double salt of sodium, having the formula $22\ WO_3\ 9\ Na_2O + 51\ Aq.$, was repeatedly obtained. The author modifies a former statement concerning salts of phosphotungstic acid containing more than 6 atoms of base, the supposed 7th and 8th atom salts proving to be either mixtures or salts of other series. The following formulas are assigned to the slightly soluble ammonium salts of this acid, prepared by him and regarded as double salts:

$$40\ WO_3\ 2\ P_2O_5\ 5\ (NH_4)_2O + 40\ Aq.$$
$$60\ WO_3\ 3\ P_2O_5\ 8\ (NH_4)_2O + 37\ Aq.$$
$$80\ WO_3\ 4\ P_2O_5\ 11\ (NH_4)_2O + 96\ Aq.$$

and to the acid, which is provisionally accepted as six basic, is accorded the formula $20\ WO_3P_2O_5\ 6\ H_2O + 38\ Aq.$ Two well-defined alkaline salts having the formulas $20\ WO_3P_2O_5\ 2\ Na_2O\ 4\ H_2O + 18\ Aq.$, and $20\ WO_3P_2O_5\ 2\ K_2O\ 4\ H_2O + 12\ Aq.$, were obtained, in which the ratio of 20 atoms of WO_3 to 1 P_2O_5 was given by analysis. The existence of salts having the ratios 24 to 1 and 18 to 1 is, however, also indicated, as, for instance, in the sodium salt: 24 $WO_3P_2O_5Na_2O$ 5 H_2O + 27 Aq. In some phospho-molybdates the ratios of MoO_3 to P_2O_5 have been found to be 20 to 1, 22 to 1 and 24 to 1, and the existence of corresponding ratios among the phospho-tungstates appears probable. In conclusion, the author notes the preparation of finely crystallized antimonio-tungstates and antimonio-molybdates of the alkalies, and the corresponding manganese salts (the latter having the formula: 6 WO_3 3 Sb_2O_5 4 MnO + 30 Aq. and 6 MoO_3 3 Sb_2O_5 4 MnO + 30 Aq.), as well as the formation of vanadio-tungstates and vanadio-molybdates of the alkalies, and regards as likely the existence of analogous salts containing SnO_2, TiO_2, ZrO_2, Nb_2O_5 and Ta_2O_5.

On Nitrogen Iodide, by J. W. MALLET.—Investigators have arrived at very different views respecting the composition of the black substance formed by the action of iodine upon ammonia, to which the formulas NI_3, NHI_2, NH_2I, NH_3NI_3 and NH_3 4 NI_3 have been assigned, a result largely due, in the author's opinion, to the fact that the substance referred to undergoes a gradual decomposition in contact with H_2O and, to a considerable extent, on drying at ordinary temperatures. For this reason, the air-dried powder often consists of a mixture of the original substance with various products of decomposition, and is therefore ill adapted to accurate analysis. The most advisable method of desiccation consists in first repeatedly and rapidly washing the product with absolute alcohol and ether (both artificially cooled), this last menstruum being subsequently removed by evaporation. The analysis of the product obtained by treating finely divided iodine with an excess of the strongest liquid ammonia (kept at 0° C.) and dried in the above manner, gave numbers corresponding to:

(*a*)	N	1 atom.
	I	2.98 atoms.

Another specimen, prepared with weaker ammonia, without precautions as to cooling, gave:

(*b*)	N	1 atom.
	I	2.47 atoms.

And a third product, at first merely washed with water, in which it was preserved for several days at ordinary temperatures, and finally washed with alcohol and ether, gave:

(*c*)	N	1 atom.
	I	2.08 atoms.