and that the age of the animal very largely determines the rapidity of development and the severity of this intoxication.

When animals of different ages are intoxicated by this metal the factor of the age of the organism in the reaction is expressed by an inability of the senile animal to maintain with the same degree of perfection a normal acid-base equilibrium as is the case with the younger animal.

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BOSTON MEETING OF THE AMERICAN CHEMICAL SOCIETY. V

On the mechanism of the potassium chlorate-manganese dioxide reaction: RAYMOND F. BACON and R. W. MILLER. As the result of their experimental investigation of the mechanism of the so-called potassium chlorate-manganese dioxide reaction, the authors conclude that: (1) Avoiding local heating, potassium chlorate and manganese dioxide begin to react at 255° C. The most vigorous reaction occurs at 310° C. (2) The potassium chlorate oxidizes the manganese dioxide at the lower temperature to form a higher unstable oxide, which is decomposed later into manganese dioxide. It is impossible to isolate this intermediate oxide on account of the great velocity of the reaction. (3) This initial oxidation generates heat, and this, coupled with the heat applied, causes the reaction to go, with a very rapid rise in temperature. This high temperature causes certain secondary reactions to occur. (4) The first of these secondary reactions between the potassium chlorate and manganese dioxide results in the formation of manganous chlorate, which decomposes into manganous chloride, chlorine and oxygen. The manganous chloride is partially oxidized to manganese dioxide and chlorine. Potassium oxide reacts with manganese dioxide, in the presence of oxygen, to form potassium manganate, which is changed by some of the chlorine to potassium permanganate. The excess of chlorine escapes. Of the potassium chlorate used, only 0.503 per cent. enters into these changes. (5) An average of 5.428 per cent. of manganese dioxide is used up in this reaction. Almost all of this loss is accounted for from the soluble manganese compounds produced in the secondary reactions. (6) The manganese dioxide serves as an interacting catalyst in this reaction, hastening the speed of the change by actually reacting with the potassium chlorate, to form an intermediate oxide, which sets free the manganese dioxide again before the conclusion of the reaction.

The measurement of the compressibilities of solids under hydrostatic pressure up to 12,000 megabars: LEASON H. ADAMS and ERSKINE D. WILLIAMSON. The compressibilities of the following metals under hydrostatic pressures from two to twelve megabars have been measured by a comparative method—silver, bismuth, copper, zinc, brass, tin, cadmium, lead, gold, aluminium, tin-bismuth alloy. The results are accurate to about 1 per cent. of their values. In the case of the more compressible metals an estimation of the falling off of the compressibilities at higher pressures is obtained.

Compounds formed by the alkali oxides K_2O and Na_2O with the trioxides of aluminum and iron: GEORGE W. MOREY. A description of the preparation and properties of some alkali aluminates and ferrites.

Sulfuric acid as an acidimetric standard: MARSTON LOVELL HAMLIN and CHARLES BLAKE CLOUD. The preparation and use of 100 per cent. H_2SO_4 for a primary acid: nitric standard is described, previous work is cited, comparison of results with standardizations by other methods is given.

The production of ozone in the corona: F. O. ANDEREGG. One of the methods for the fixation of nitrogen is its "burning" in the electric arc, the combination being due chiefly to the ions. The laws that govern the important relationships between ionization and chemical action are still obscure. To simplify the problem the study with a single gas has been begun with the formation of ozone in the corona which is probably the simplest form of electrical discharge occurring at atmospheric pressure. Opposed to the ozonizing effect there is a deozonizing effect with a resulting equilibrium.

Some properties of the oxides of lead: L. H. ADAMS and H. E. MERWIN. The oxides PbO and Pb_3O_4 were prepared in well crystallized form and their densities and optical properties determined. The monoxide exists in two polymorphic modifications having an enantiotropic inversion point at about 570°. Some interesting effects of pressure on crystals of the yellow form of PbO are described.

A new illuminator for microscopes: ALEXANDER SILVERMAN. The illuminator consists of a small circular tube lamp surrounding the objective, and operated by a six-volt storage cell. It may be lowered into a hollow object, the lamp being attached to the microscope tube and moving with it. Especially convenient for the study of enamels, alloys, opaque objects and substances contained in opaque vessels. A model will be exhibited in operation.

The qualitative separation and detection of gallium: Philip E. Browning and Lyman E. Porter. A study of the occurrence of the element shows it to be most closely associated with Pb, Al, Fe, Mn, Zn and In. Analytically it falls into the Al group, its hydroxide being precipitated by NH_4OH in the presence of NH_4Cl and being soluble in an excess of NaOH. The chief analytical problem is its separation from Al and two methods are studied, both of which give satisfactory results. First, the method of de Bois Vaudran, precipitating $Ge_3(FeC_6N_6)_4$ by $K_4FeC_6N_6$ in the presence of strong HCl to about one third the volume of the liquid. Second, saturating a solution with HClga in the presence of ether, which throws out the $AlCl_3$ and keeps the Ga in solution.

The qualitative detection of germanium and its separation from arsenic: Philip E. Browning and Sewell E. Scott. A study of the occurrence of the element shows it to be most closely associated with Ag, Pb, Hg, Cd, As, Sn, Zn, Ti and Cb. It falls in the analytical group with As and Sn since its sulphide is soluble in $(NH_4)_2S$. It is separated from Sn by treating the sulphides with $(NH_4)_2CO_3$, GeS_2 being soluble. From As it may be separated by treating a solution of the sulpho salts with ammonium acetate, acidifying with acetic acid and passing H_2S. As_2S_3 is precipitated and Ge remains in solution. The following modification of Buchanan's method was devised for the separation and detection of Ge. The germanium material was dissolved in strong hydrochloric acid (5–10 $cm.^3$) in a test tube some $KMnO_4$ added, to keep arsenic if present in the higher condition of oxidation and distilled into another test tube kept cool in water. After distilling about one half volume the Ge is found in the distillate by means of H_2S.

Silver anion: H. C. P. Weber. It is customary to think of silver as a strictly monovalent element, which forms in solution a positive ion. When a solution of a silver salt is electrolyzed at high current density a black deposit is formed at the anode which has been variously described as silver peroxide and as silver peroxynitrate, the formulas ascribed varying but tending to indicate the presence of trivalent silver. It is now shown that in this compound we have silver which in transference experiments acts as an anion, probably trivalent, a very unstable and intensely active oxidizing agent. It is not derived from hydrogen peroxide but rather of the permanganate type. The compound is of great interest in connection with the valence of silver in particular, and valence in general.

The fixation of nitrogen with the silent electric discharge: Farrington Daniels and Oliver R. Wulf. The oxidation of nitrogen by the silent or cold electric discharge has been proved. No energy is lost as heat, and under the proper conditions nitrogen pentoxide instead of nitrogen peroxide is formed. This should simplify the absorption towers. Pressure favors this reaction but not the reaction which gives nitric oxide. Practical applications have failed because the reaction is too slow. A search for a catalyzer was unsuccessful. Experiments with various types of discharge chambers look hopeful.

The displacement of nitric by carbonic acid in silver nitrate solutions and the relation of this reaction to the inclusion error in the silver voltameter: A. S. McDaniel and H. D. Hineline. It has been shown that carbon dioxide reacts slowly with silver nitrate in aqueous solution forming a carbonate of silver and liberating free nitric acid. Crystals of the carbonate have been isolated and identified. The nitric acid liberated has been estimated by titration with iod-eosin and its amount compared with the silver contained in the crystals of silver carbonate. The reaction is believed to be as follows:

$$Ag\ NO_3 + H_2CO_3 \rightleftarrows Ag\ HCO_3 + HNO_3.$$

About one one-hundredth of one per cent. of the silver nitrate is converted to the carbonate. In the silver voltameter a clear solution of silver nitrate which has been saturated with CO_2 gives a deposit about 0.4 per cent. too heavy. This effect was first shown by Rosa Vinal and McDaniel, but it was thought by them that the amount of CO_2 normally present in air has no appreciable effect upon the mass of deposit. In the present investigation a few direct measurements have been made of the effects produced by one to ten times the normal amounts of CO_2 present in the air and while the results are incomplete they indicate that the effect of the normal amount of CO_2 in the air is not negligible and indeed may be larger than the inclusion error in normal deposits.

(To be continued)