The Action of Potassium Amide on Tungsten Dibromide

Potassium amide reacts with tungsten dibromide to give a potassium ammonotungstite resembling in appearance and properties and approaching in composition the tungstites prepared from tungsten pentabromide. The valence of the tungsten in the ammono salt has not been determined.

Preparation 1: Total subs., (25°) 0.3988; (110°) 0.3922: 0.2356 g. of the heated subs. gave 0.1830 WO_3 and 0.1217 K_2SO_4; 0.1429 g. gave 0.0075 AgBr.

Preparation 2: The tungstite precipitate remained in contact with an excess of potassium amide for four months. The nitrogen content was low, in spite of an initial slow hydrolysis under the action of water vapor.

Subs., (20°) 0.4230; (1/1) 0.3185 WO_3; (1/5) 0.0007 AgBr. (2/5) 0.0009 WO_3 and 0.1010 K_2SO_4. (2/5) 0.01301 N.

Calcd. for $W(NHK)_2.NH_3$: W, 59.5; N, 13.6; K, 25.3. Found: W, 60.6, 60.2; N, 7.7; K, 22.8; 26.8; Br(No. 2), 0.4. No. 1 contained ammonobasic tungsten bromides in larger quantity than No. 2.

Attempts to Prepare Nitrides of Tungsten and Molybdenum

Attempts to prepare these compounds by pouring a solution of potassium amide into an excess of solutions of molybdenum tribromide and tungsten pentabromide led to the production of ammonobasic mixtures.

In conclusion, the author wishes to thank Dr. Franklin, at whose suggestion and under whose direction this work was done.

Summary

1. The action of liquid ammonia on certain halides of molybdenum and tungsten has been briefly described.

2. Potassium ammonomolybdite, $Mo(NK)_2NH_2$, a derivative of pentavalent molybdenum, and a potassium ammonotungstite, perhaps of analogous composition, have been prepared.

3. In the precipitation of potassium ammonomolybdite and tungstite free potassium in small amounts was formed by a reduction of potassium amide, molybdenum or tungsten presumably being nitridized to an equivalent extent.

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NOTE

The Resistance of Platinum Films in the Presence of Hydrogen.—The mechanism of adsorption of a gas by a metal is considered in some circles to involve the momentary sharing of electron pairs by the gas molecule and the metallic surface. If we assume that the valence electrons are identical with the free electrons that presumably carry the current in metallic conduction of electricity, then an adsorbed gas should affect certain electrical properties of the metal. To test this idea, the author prepared exceedingly thin films of platinum on Pyrex glass by thermal evaporation of the platinum and condensation on the glass in a vacuum.

Resistance measurements were made at 18° on these films from time to time. When constancy was reached, nitrogen was admitted to the tube and further measurements were made to determine the effect. The nitrogen was then pumped out and hydrogen admitted and its effect on the resistance determined.

Results

The curves in Fig. 1 illustrate the results. The most pronounced feature evidenced in the curves is the variation of the resistance of the films with time. In two of the experiments the presence of hydrogen seemed to increase the resistance of the films. No conclusions may be drawn, however,

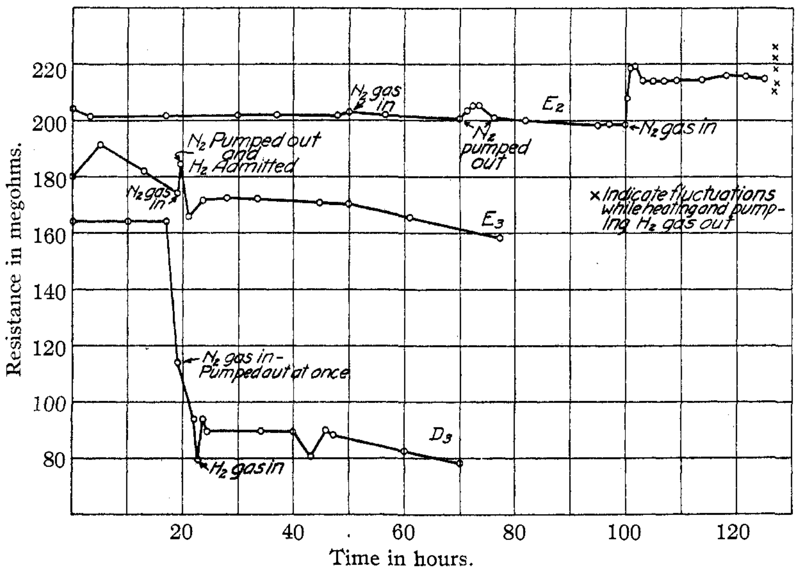

Fig. 1.—Curves showing change in resistance of platinum films when nitrogen and hydrogen were admitted.

since the results could not be duplicated at will. These films show certain peculiar properties which it is well to mention here. (1) The resistance of the film changes with time. (2) The temperature coefficient of resistance is the reverse of that of the bulk metal. (3) At elevated temperatures it was impossible to get a film even after many hours of operation. Instead, the metal was deposited in the closed tube leading to the vacuum line. (4) At liquid-air temperature the film deposits very quickly. (5) At ordinary temperatures the film is slow to start, but builds up very quickly when started.

These facts bear out the conclusions of R. W. Wood,[1] Swann[2] and others

[1] Wood, *Phil. Mag.*, [6] **32,** 364 (1916).

[2] Swann, *ibid.*, **28,** 467 (1914).

that these films are not homogeneous but consist of many little aggregates of metal. As the film builds up, these aggregates gradually come together, thus forming a conducting film. With time, the aggregates of any particular film gradually coalesce, hence causing a continuous decrease in the resistance. The resistance is, therefore, due in part to the gaps between aggregates. An accidental jar may suddenly break a number of the contacts, thereby causing a sudden increase in the resistance. Heating causes the molecules to accelerate in motion, and hence increases the number of contacts, and causes a decrease in resistance instead of the usual increase.

It is a curious fact that all of the impacts of metal on the glass are not inelastic in spite of the fact that the temperature of the wall is far below the condensation temperature of the metal. The number of inelastic impacts decreases as the temperature increases; hence it is easier to obtain a film at very low temperatures.

The difficulty in obtaining any degree of constancy in the resistance of the films seemed to indicate that it was inadvisable to attempt any further experiments along this line.

These experiments were made while the author was a National Research Fellow in Chemistry.

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A CHEMICAL INVESTIGATION OF CHAULMOOGRA OIL. I

BY TADAICHI HASHIMOTO

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Introduction

In recent years chaulmoogra oil has assumed considerable importance in connection with the treatment of leprosy, as it seems to be the only known effective remedy for this disease. The experimental treatment of leprosy with the oil or with its derivatives has been carried out in various places and has definitely established the value of the oil for this purpose.[1]

[1] Hollmann and Dean, *J. Cut. Dis.*, **37**, 367 (1919). Heiser, *Public Health Rept.*, **29**, No. 42, 2763 (1914). McCoy and Hollmann, *Public Health Service Bull.*, **75** (1916). Rogers, *Indian Med. Gaz.*, **51**, 195, 437 (1916); **54**, 165 (1919); **55**, 125 (1920); *Indian J. Med. Res.*, **5**, 277 (1917); *Brit. Med. J.*, **2**, 559 (1916); *Lancet*, **200**, 1178 (1921). Carthews, *Indian Med. Gaz.*, **1918.** MacDonald and Dean, *Public Health Ped.*, **35**, No. 34, 1959 (1920). MacDonald, *J. Am. Med. Assoc.*, **75**, No. 27, 1483 (1920). Sweeney and Walker, *J. Infectious Diseases*, **26**, 238 (1920). Schöbl, *Philippine J. Sci.*, **23**, No. 6 (Dec., 1923).