phuric acid (1.1). The current registered 1 ampere and 4 volts. In four minutes the solution was colorless. The current was allowed to act for ten minutes.

Volume of the solution .... = 10 cubic centimeters.
Copper sulphate .... = 0.1150 gram copper.
Aluminium sulphate............... = 0.1 gram aluminium.
Sulphuric acid .... = 0.5 cubic centimeter.
Current .... = 1–1.6 ampere.
Pressure........................ = 4–4.5 volts.
Time .... = 10 minutes.
Copper found .... = *0.1150* gram, *0.1153* gram, *0.1152* gram.

A low current (0.01 ampere and 2 volts) was passed through zinc sulphate in the presence of 0.25 cc. of sulphuric acid. In twenty minutes the mercury had increased 0.0006 gram in weight.

Iron sulphate containing 0.1110 gram of iron, acidulated with 0.5 cc. of acid, with a current of 0.01 ampere and a pressure of 2 volts gave in thirty minutes 0.0434 gram of iron. When 1 cc. of acid was present, a current of 0.1 ampere with a pressure of 2 volts gave 0.0911 gram of metal.

The separation of copper from zinc was attempted but it was not successful. A copper solution containing 0.1150 gram of copper in the presence of 2.5 cc. of acid and a current of 0.6 ampere and three volts, caused the mercury to increase in weight 0.1360 gram, showing that 0.0212 gram of zinc had also been deposited.

The separation of copper from iron was tried, but this, too, failed. With a current (like that given in the preceding paragraph) iron was detected in the mercury, and in thirty minutes the solution still showed the presence of copper. 0.25 cc. of acid was present. The iron seemed to hold back the copper.

When 3 cc. of acid were present in a solution of iron sulphate, containing 0.1 gram of iron and it was electrolyzed with a current of two amperes and four volts, 0.069 gram of iron went into the mercury. The experiment was repeated after the addition of 4 cc. of acid. Even this quantity failed to hold up all the iron. The separation, therefore, of iron from copper and of iron from zinc was unsuccessful.

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THE USE OF A ROTATING ANODE IN THE ELECTROLYTIC PRECIPITATION OF URANIUM AND MOLYBDENUM

By Edgar T. Wherry and Edgar F. Smith.

I. URANIUM

The early suggestion of Smith[1] that uranium could be completely precipitated by the current from an acetate electrolyte has been amply veri-

[1] Am. Ch. J., 1, 329.

fied, and the purpose of these lines is only to record the conditions under which the deposition takes place when using a rotating anode. The salt applied in the experiments was uranyl sulphate. The form of apparatus and mode of rotation have been fully discussed in the numerous communications from this laboratory relating to the rapid precipitation of metals. It will not be necessary either, to comment further upon the form in which the uranium is precipitated or upon the subsequent treatment of the deposit. These points have been sufficiently dwelt upon in earlier communications.[1]

The results and conditions are :

No.	U_3O_8 Present in Grams	Acetic Acid cc.	Sodium Acetate in Grams	Current in Amperes	Volts	Time in Minutes	Temp.	U_3O_8 Found in Grams
1	0.1527	0.2	2½	3	14	18	ord.	0.1513
2	0.1527	0.2	4¼	3	12	15	"	0.1525
3	0.2613	0.3	5½	7	15	8	60°	0.2611
4	0.2613	0.25	4½	4	12	3	50	0.0344
5	0.2613	0.25	4½	4	12	15	50	0.0530
6	0.2613	0.25	4½	4	12	10	50	0.1074
7	0.2613	0.25	4½	4	12	18	50	0.1935
8	0.2613	0.25	4½	4	12	25	50	0.2467
9	0.2613	0.25	4½	4	12	30	50	0.2611
			Am. Carbonate in Grams					
10	0.2613		1	5	15	25		0.2600
11	0.2613		2	5	13	30		0.2613

From both of these electrolytes the precipitation is not only complete but exceedingly rapid ; hence, this method for the determination of uranium will recommend itself to the mineral analyst. The following curve was plotted from the preceding experiments.
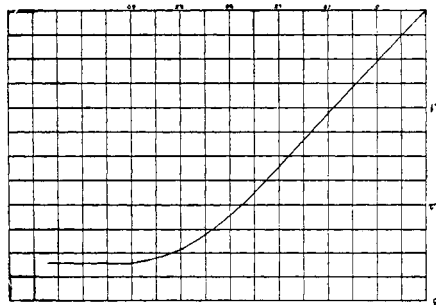
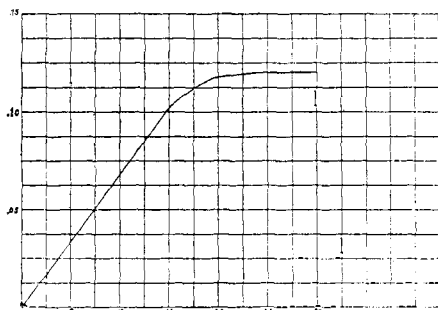CURVE I. Rate of deposition of Uranium Sesquioxide.

II. Molybdenum

From acidulated molybdate solutions the hydrated susquioxide is completely precipitated as an adherent deposit on the cathode. The pro-

[1] Smith's "Electrochemical Analysis," p. 94.

cedure has given an excellent and satisfactory method for the estimation of molybdenum as well as a most gratifying means of separating it from the alkali metals. The conditions were as follows :

No.	MoO_3 Present in Grams	Dilute Sulphuric Acid (1:10) in cc.	Potassium Sulphate in Grams	Current in Amperes	Volts	Time	MoO_3 Found
1	0.1200	2	1	5	16	30	0.1197
2	0.1200	2	1	5	16	5	0.0335
3	0.1200	2	1	5	16	9	0.0603
4	0.1200	2	1	5	16	15	0.1026
5	0.1200	2	1	5	16	20	0.1190
6	0.1200	2	1	5	16	25	0.1198

From these data the following curve was drawn :

CURVE II. Rate of deposition of Molybdenum Sesquioxide.

The rapidity with which the oxide separates and the ease with which the determination of molybdenum may be carried out in this way bids fair to render the electrolytic procedure the preferable method with all those who acquaint themselves with it.

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THE QUANTITATIVE SYNTHESIS OF SILVER NITRATE AND THE ATOMIC WEIGHTS OF NITROGEN AND SILVER.

BY THEODORE WILLIAM RICHARDS AND GEORGE SHANNON FORBES.

Introduction

The composition of silver nitrate is one of the questionable premises in the lively argument which has recently taken place concerning the atomic weights of nitrogen and silver.[1] Although Stas's syntheses of this salt were carried out on a large scale, and far more carefully than those of anyone before him, several points concerning the details of the work were not investigated with the care which modern physicochemical

[1] The reader is referred for a convenient résumé to the Report of the International Committee on Atomic Weights, This Journal, **28**, 1 (1906), and many other places ; also to Clarke, This Journal, **28**, 293 (1905) ; Gray, J. Chem. Soc. (London), **89**, 1173 (1906).