perature, thin gold-like scales are obtained which are probably $K_2O.3PtO_3$. The potassium is removed by dilute acid and the trioxide, PtO_3, is obtained, which is extremely unstable. By the careful chlorination of $PtCl_2$, or dechlorination of $PtCl_4$ at 390°, $PtCl_3$ was obtained as a greenish black powder, which is slightly soluble in cold water, and which dissolves rapidly in boiling water with the formation of the acid H_2PtCl_3O, some hydrolysis also taking place. By precipitation with sodium carbonate pure platinum sesquioxide hydrate was obtained, but the sesquioxide could not be prepared. The hydrate dissolves in hydrochloric acid but the solution immediately decomposes into a mixture of chloroplatinous and chloroplatinic acids. If, on the other hand, cesium chloroplatinite in dilute solution is treated with chlorine water a dark green precipitate of the "sesquichloride," or pentachloride, Cs_2PtCl_5, is obtained, which has a strong tendency to decompose into the chloroplatinite and chloroplatinate. According to Werner's nomenclature, the platinum acids would receive the following names: H_2PtCl_4, tetrachloro-plat*o*-acid; H_2PtCl_5, pentachloro-plat*i*-acid; H_2PtCl_6, hexachloro-plat*e*-acid; H_2PtO_4, plat*on*-acid. In addition to the iridium salts spoken of above, Gutbier[1] has prepared similarly a large number of salts of bromoplatinic acid with organic bases. His bromoplatinic acid was prepared by evaporating chloroplatinic acid several times on the water bath with hydrobromic acid, the last time with the addition of bromine. The free acid, $H_2PtBr_6.9H_2O$, was obtained by evaporation over lime. The two isomers of the compounds of platinum dichloride with organic sulfides are accounted for by Werner by stereoisomerism. The third modification of the methyl sulfide salt, it has been suggested, may be constituted after the type of the green salt of Magnus. This, Chugaev and Subbotin[2] now show to be the case, its constitution being, in fact, $(Pt.4(CH_3)_2S)PtCl_4$. Further, it is found that other organic sulfides can form platinum salts after this same type. By the action of formaldehyde on a solution of potassium chloroplatinate and selenium dioxide in an excess of caustic potash, Minozzi[3] has obtained platinum triselenide, $PtSe_3$, which on heating to a low red heat in carbon dioxide gives the diselenide, $PtSe_2$. Both are stable compounds, little acted on by acids.

The experiments of Fischer and Schröter on argon have been extended[4] and 45 metals examined in the electric arc in liquid argon. In no case could argon compounds be obtained, nor was there any evidence of the formation of any such even transitionally.

WASHINGTON AND LEE UNIVERSITY.
LEXINGTON, VIRGINIA.

NOTES.

The Efficiency of the Borax Bead Tests for Nickel and Cobalt.—In order to determine the reliability of the borax bead tests for nickel and cobalt (in the presence of each other), a few simple tests were carried out. As the object of these experiments was to ascertain the efficiency

---

[1] *Ber.*, 42, 4243.

[2] *Ibid.*, 43, 1200.

[3] *Atti accad. Lincei, Rome*, [5] 18, ii, 150.

[4] *Ber.*, 43, 1435, 1442, 1454, 1465.

of these bead tests as applied in qualitative analysis, only that degree of refinement of method was practiced which obtains in careful qualitative analysis.

Solutions of nickel and cobalt nitrates were mixed in varying proportions and the point determined at which either of the metals interfered with the other. The two metals were completely precipitated as sulfides by hydrogen sulfide, in the presence of a sufficient excess of ammonia. Portions of the freshly precipitated sulfides were then fused in the borax beads and the beads, which were of approximately uniform size, were viewed by daylight. All tests were made in duplicate and all the beads were fused in both the oxidizing and reducing flames.

The following results were obtained:

Parts nickel.	Parts cobalt.	Results when held in oxidizing flame.	Results when held in reducing flame.
1	1	Blue bead	Blue bead
2	1	Blue bead	Blue bead
3	1	Blue bead	Blue bead
5	1	Blue bead	Blue bead
7	1	Blue bead	Blue bead
10	1	Blue bead	Blue bead
20	1	Blue bead	Blue bead
30	1	Blue bead	Uncertain violet
40	1	Uncertain brownish	Uncertain brownish
45	1	Uncertain brownish	Uncertain brownish
50	1	Brown bead	Brown bead

The same results as above were also obtained from the hydroxides precipitated from similar solutions by sodium hydroxide.

An examination of the above results indicates that:

One part of cobalt can be detected in the presence of thirty of nickel. If, however, the ratio of the nickel to cobalt be increased, uncertain results are obtained until the ratio is about fifty to one when a decidedly brown bead shows the presence of nickel. Again one part of cobalt in fifty of nickel would certainly be lost if the bead tests were solely relied upon. It is evident, therefore, that the borax bead tests for nickel and cobalt can serve only as confirmatory tests, and that reliance can be placed upon them only when the results are affirmative.

L. J. CURTMAN.
P. ROTHBERG.

COLLEGE OF THE CITY OF NEW YORK,
November. 1910.

A Good Substitute for the Platinum Triangle.—While working with an alloy of nickel and chromium in form of a resistance wire manufactured by the Driver-Harris Wire Co., its resistance to the common laboratory fumes and oxidation at the temperature which it is possible to obtain with the ordinary blast lamp, made it occur to the writer that this wire might be used to advantage to replace the ordinary platinum triangle.